

APPENDIX B BIOLOGICAL ASSESSMENT

Biological Assessment for the Imperial Sand Dunes Recreation Area

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1.0 Introduction

The purpose of this Biological Assessment (BA) is to review the Draft Imperial Sand Dunes Recreation Area Management Plan (RAMP) to determine the extent implementation of the RAMP may affect the threatened Peirson's milk-vetch (*Astragalus magdalenae* var. *peirsonii*), threatened desert tortoise (*Gopherus agassizii*), and proposed threatened flat-tailed horned lizard (*Phrynosoma mcallii*). The Bureau of Land Management (BLM) is requesting formal consultation on the Peirson's milk-vetch and desert tortoise, and a formal conference on the flat-tailed horned lizard. Because the RAMP is a planning document, this BA focuses on the effect of management actions to be implemented as a part of this planning effort. The actions addressed within this BA do not fall within critical habitat of any species protected under the Endangered Species Act (ESA).

This BA has been prepared in accordance with legal requirements set forth under Section 7 of the ESA (16 U.S.C. 1536(c)), and follows the standards established in the National Environmental Policy Act (NEPA) and ESA guidance established for the BLM. As the lead federal agency, BLM will oversee compliance with laws, ordinances, regulations, and standards (LORS) required for the project, as well as conservation and mitigation measures. The BLM has also prepared a Draft Environmental Impact Statement (DEIS) to analyze the potential environmental impacts resulting from the revision and updating of the RAMP. Detailed information and impact assessment on other special-status species at the Imperial Sand Dunes Recreation Area (ISDRA) is presented in the DEIS.

1.1 Purpose and Need

1.1.1 Purpose

The RAMP guides all resource management activities and establishes management prescriptions for the ISDRA (Figures 1-1 and 1-2). The goal of the RAMP is to provide a comprehensive and detailed management plan designed to provide a variety of sustainable OHV and other recreational activities, and to maintain or improve the conditions of the special-status species and other unique natural and cultural resources while creating an environment to promote the health and safety of visitors, employees, and nearby residents.

The RAMP establishes:

- Resource Area-wide multiple-use goals and ecosystem management objectives
- The Plan Area management prescriptions that fulfill the requirements of the Federal Land Policy and Management Act (FLPMA) of 1976
- Management area direction including management area prescriptions applying to future management activities in specific management areas
- Monitoring and evaluation requirements

The RAMP embodies the provisions of FLPMA, the implementing regulations, and other guiding documents. It is developed in accordance with the California Desert Conservation Area (CDCA) Plan of 1980 and will amend portions of the CDCA Plan pertaining to recreation management in the ISDRA. It revises and replaces the 1987 RAMP.

The RAMP will specify what levels of visitor use can be provided for motorized vehicle use in the ISDRA while maintaining the habitat requirements for special-status species, conserving cultural resources, providing reasonable consideration for other important natural resources and providing for the health and safety of visitors, nearby residents, employees, and other service providers in the ISDRA.

It will institute measures to achieve desired visitor use levels; maintain habitat requirements for special-status species; conserve cultural resources; provide reasonable consideration of other important natural resources; and provide for the health and safety of visitors, nearby residents, employees, and other service providers in the ISDRA. It will establish criteria for modifying those measures or instituting additional measures if needed in the future, based on monitoring of visitor use and the conditions and trends of special-status species, cultural resources, and important natural resources.

The RAMP will identify the type and level of visitor services, including facilities, needed to support desired visitor use. For services to be provided by BLM, the RAMP will identify cost for these services. The RAMP will establish a fee system such that the appropriate level of visitor services can be provided in an efficient, cost-effective manner.

The RAMP will identify needed adjustments to land tenure. It will identify management guidelines for use of the existing right-of-way corridor and areas with right-of-way agreements. It will establish two utility right-of-way corridors, an underground corridor along State Route (SR) -78 and a corridor along the existing railroad right-of-way. It will also confirm decisions from the CDCA Plan and current RAMP that are still valid and will not be revised by the revised RAMP.

Management area allocations, prescriptions, monitoring, and evaluation requirements constitute a statement of BLM's intended direction. However, projected outputs, services, and rates of implementation are contingent upon obtaining funding, including grants, agreements, and the annual budgeting process.

The RAMP will guide the ISDRA beginning in 2002. It will normally be revised every 10 years, but may continue to be used for up to 15 years. It may be amended or revised at any time if the Field Manager determines that conditions in the ISDRA have changed beyond those anticipated by the Plan, or if monitoring or project-level environmental analysis indicate a need for a change in management direction.

The RAMP implements the EIS Preferred Alternative (Alternative 2). It is the alternative the Field Manager has determined will most benefit the public. Careful consideration was given to coordinating and balancing various conflicting resource uses to arrive at a sustainable mix.

1.1.2 Need

The ISDRA offers outstanding recreational opportunities for off-highway vehicle (OHV) recreation in the California Desert District. To fulfill its management obligations under federal regulations, the BLM must carefully manage OHV use, so that the conditions of the special-status species and other unique natural and cultural resources are maintained or improved. The type and level of OHV use also must be carefully managed to create an environment that promotes the health and safety of visitors, employees, and nearby residents.

Because the previous plan was written in 1987, several of the projects identified have been implemented. Of the projects that were not implemented, many may no longer be feasible. Therefore, it is critical to revisit some of the past decisions and determine whether or not new courses should be charted.

Since the 1987 RAMP, several regulatory changes have taken place that relate to the ISDRA. The U.S. Fish and Wildlife Service (USFWS) has listed the Peirson's milk-vetch and desert tortoise as a federally threatened plant. The flat-tailed horned lizard has been proposed as federally threatened by the USFWS. The North Algodones Dunes Wilderness was designated in 1994. Wilderness Study Area (WSA) 362 has been released from further studies concerning its suitability for wilderness designation. Analyzing this new information may lead to different management decisions in the future.

The proximity of the ISDRA to private land and wilderness requires that the BLM carefully manage the recreation, natural, and cultural resources, and corresponding resource values (such as "scenic values") within the Plan Area to reduce potential impacts to nonfederal property.

Southern California's continued population growth in the urban and nonurban areas and shifting demographic patterns have increased the demand for outdoor recreation at the ISDRA and neighboring areas. Related to this, the problem of trespass in the North Algodones Dunes Wilderness and private lands (both within and adjacent to the Plan Area) has traditionally created conflicts between OHV enthusiasts, landowners, and concerned members of the public. It continues to be a management challenge to encourage appropriate recreational use, discourage inappropriate use, while respecting the freedom of visitors to enjoy the ISDRA.

In addition to discussing the positive recreational uses of the ISDRA, the RAMP discusses a variety of issues, their proposed solutions, and opportunities for creative improvement.

1.2 Consultation to Date

The following is a summary of meetings and correspondence that were important to the decisionmaking process.

- December 17, 1996: Conference Opinion for the Construction of the Proposed Gray's Well (Herman Schneider Bridge) east of El Centro, California (1-6-97-F-8).
- October 14, 1999: The letter memorandum confirms Conference Opinion 1-6-97-F-8 as the Biological Opinion for the Gray's Well Bridge (Herman Schneider Bridge) Project.

- July 13, 2001: USFWS letter to BLM, concurring that the closure of 49,305 acres of Algodones Dunes to motorized vehicles is not likely to adversely affect Peirson's milk-vetch.
- October 16, 2001: BLM letter to USFWS, Carlsbad, requesting concurrence on the list of species to be addressed in the BA. Letter delivered to Sandy Vissman, USFWS.
- October 16-17, 2001: Site visit with USFWS to view habitats and discuss major issues, concern, and opportunities (ICOs), within the ISDRA project site boundary (BLM, 2001h).
- October 30, 2001: Letter initiating consultation with the USFWS on the proposed RAMP for the ISDRA.
- October 30, 2001: Meeting with USFWS to review the Thomas Olsen and Associates Monitoring Report for Peirson's milk-vetch (ISDRA RAMP Project) (TOA, 2001).
- October 31, 2001: USFWS letter to BLM concurring that the temporary camping closure on the east side of Algodones Dunes is not likely to adversely effect the desert tortoise.
- November 2, 2001: Teleconference between BLM and USFWS natural resource specialists to discuss various project alternatives in terms of sensitive resource protection.

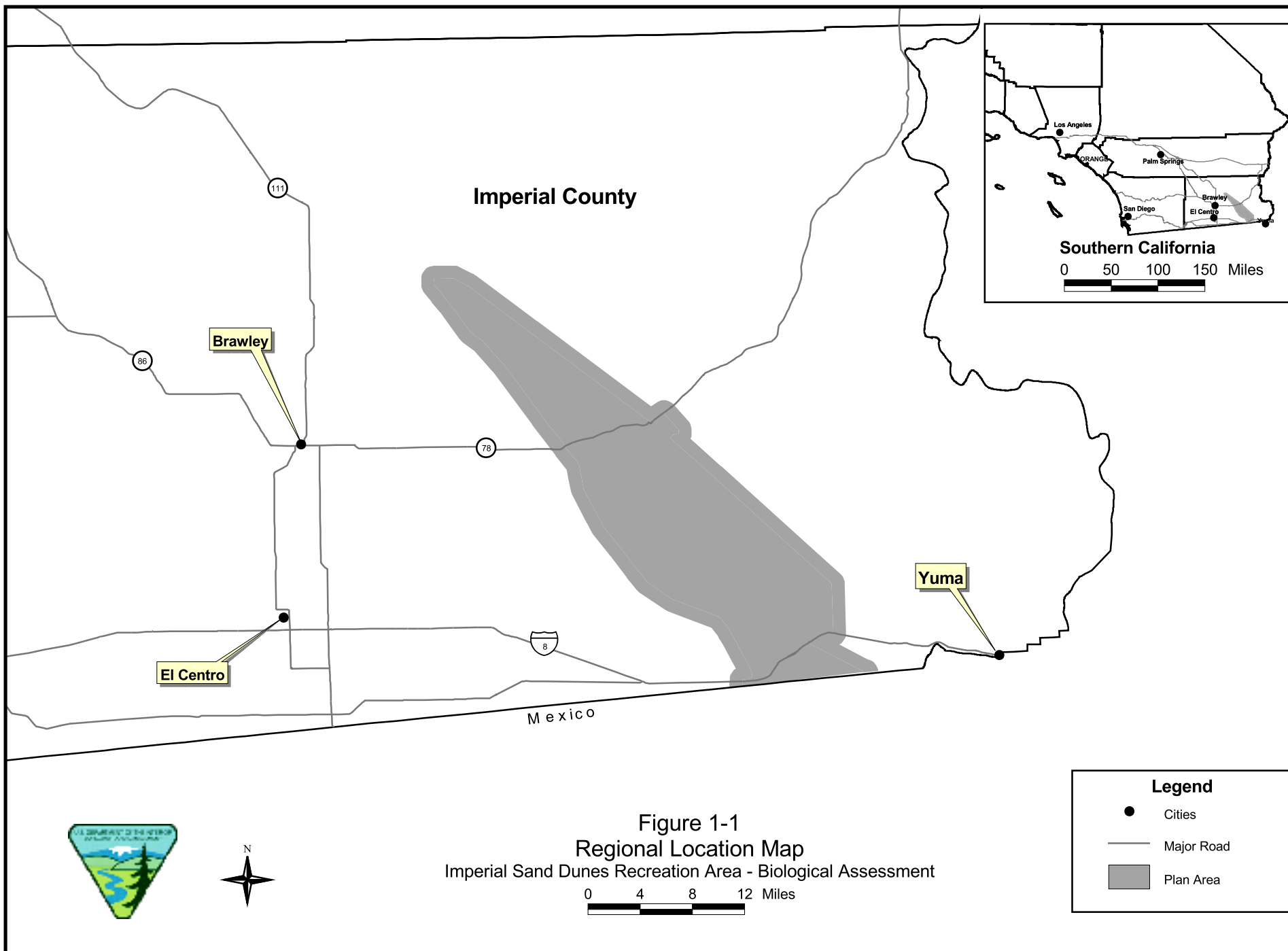
1.3 Interim Closures/Temporary Camping Closure

1.3.1 Peirson's Milk-vetch

On November 3, 2000, a legal stipulation respecting the Peirson's milk-vetch, designated as threatened under the ESA, became effective; and five parcels in the ISDRA were closed to motorized vehicle use. The closure boundaries are identified by sign posts and identified in the Amended Stipulation and Order Concerning Injunctive Relief for the Peirson's Milk-Vetch, Case No. C-00-0927 WHA-JCS. Four closure areas were named, while the fifth parcel was unnumbered, but was described as the Patton Valley Area. These areas are delineated in Figure 1-3, and total approximately 49,000 acres.

1.3.2 Desert Tortoise

On October 18, 2001, the legal stipulation respecting the desert tortoise became effective; and a temporary camping closure on approximately 25,600 acres of desert tortoise habitat within the ISDRA was approved. The camping closure is located east of Glamis and the Union Pacific Railroad (UPRR). As with other ISDRA management directions, the camping restriction does not apply to private lands within the closure area, nor does it restrict the use of motorized vehicles on existing routes of travel otherwise allowed by the CDCA Plan and 1987 RAMP.



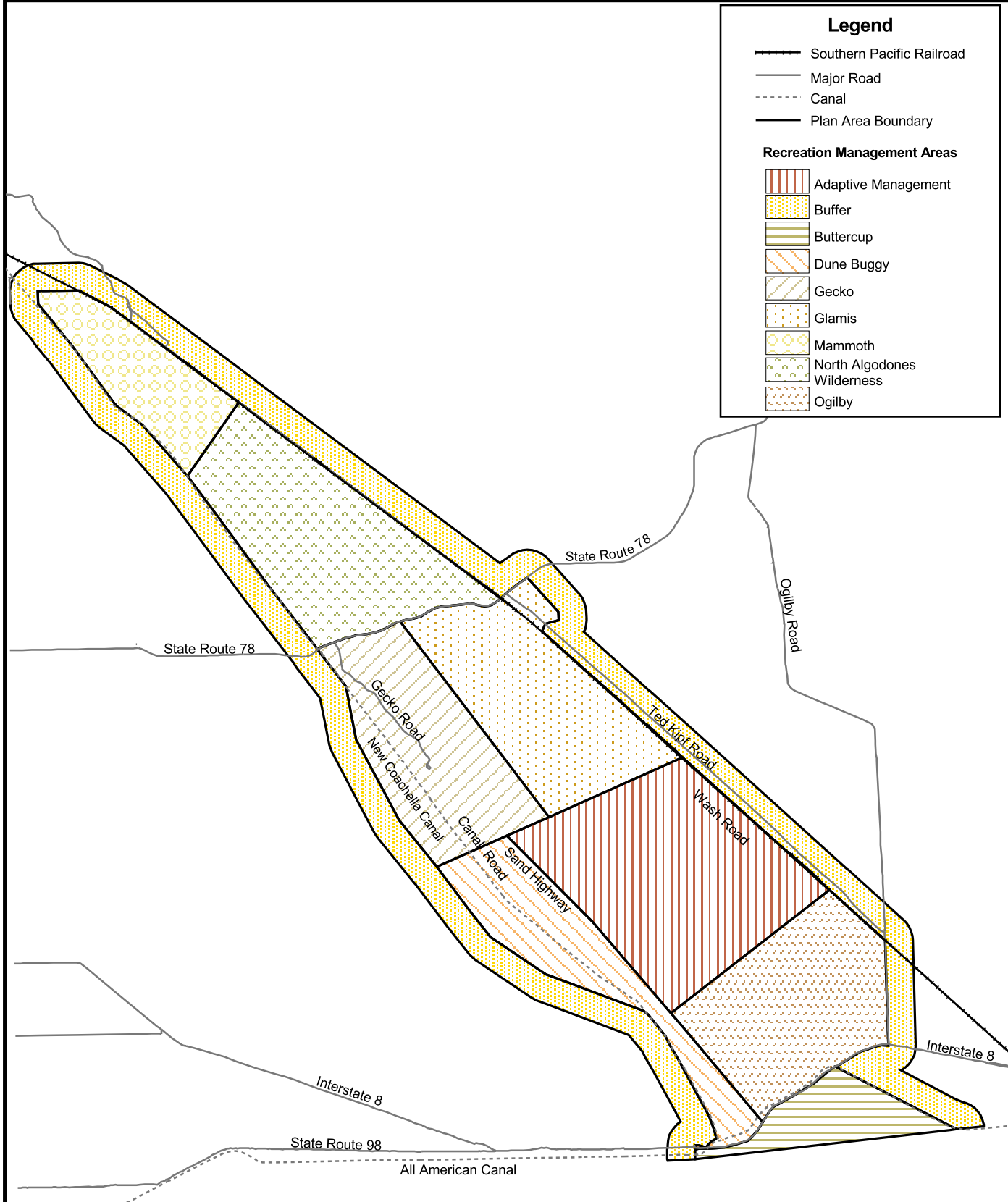


Figure 1-2
ISDRA Plan Area

Imperial Sand Dunes Recreation Area - Biological Assessment



0 2 4 6 Miles

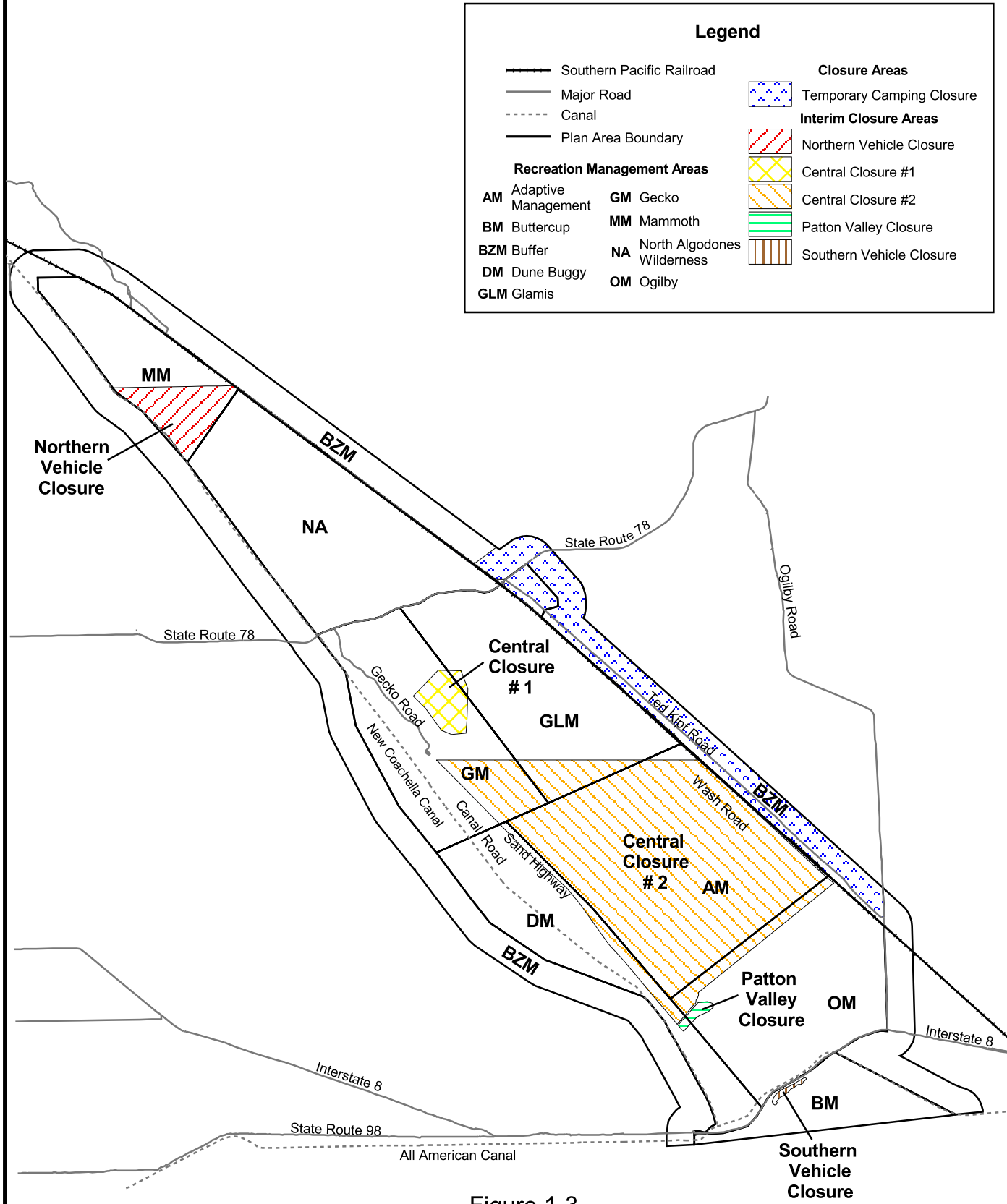


Figure 1-3
Interim Closure Areas
Imperial Sand Dunes Recreation Area - Biological Assessment



0 2 4 6 Miles

2.0 Summary of Actions Prescribed by Draft RAMP

2.1 No Action Alternative

Under the No Action Alternative (Alternative 1 in the DEIS), the ISDRA would continue to be managed according to the existing and approved management plan and policies (e.g., the 1987 RAMP). In addition, the No Action Alternative would include compliance with policies and management measures instituted since the 1987 RAMP was first implemented, including the designation of the North Algodones Dunes Wilderness in 1994 and the release of Wilderness Study Area (WSA) 362 from further suitability studies. This alternative does not include the interim OHV closure areas or the temporary camping closure because these are interim measures and not part of the management policy for the ISDRA. The CDCA Plan would not be amended under this alternative, and no adaptive management program would be implemented.

Because the ISDRA would continue to be managed according to existing and approved management plans prescribed by the 1987 RAMP, this alternative would develop facilities only to the extent directed by that plan. The No Action Alternative would not result in precisely the same implementation actions prescribed by the 1987 RAMP because management needs must also accommodate the findings of more recent resource inventories at the ISDRA, as well as updated regulations that could constrain full implementation (e.g., new facilities would not be allowed in the wilderness area). Under this alternative, the management areas that would apply to the action alternatives would not be created; and no Recreation Opportunity Spectrum (ROS) classifications would be assigned to the ISDRA. Therefore, management actions would default, with the exceptions noted above, to the 1987 RAMP. The No Action Alternative is described here as a baseline for comparison with the proposed actions.

2.2 Description of the Draft RAMP

On the basis of the ICOs and the goals established for the ISDRA, the BLM has delineated the ISDRA and adjacent BLM-administered lands into nine management areas (Figure 2-1). This section describes Draft RAMP in the context of planned management activities that apply to the entire ISDRA. In addition, actions specific to the nine management areas that comprise the ISDRA are also presented. The ISDRA management areas are:

- Mammoth Management Area
- North Algodones Dunes Wilderness Management Area
- Gecko Management Area
- Glamis Management Area
- Adaptive Management Area
- Ogilby Management Area

- Dune Buggy Flats Management Area
- Buttercup Management Area
- Buffer Zone Management Area

2.3 Management Areas and Actions

Presented below is a summary of the Draft RAMP as it applies to the ISDRA and, where applicable, to the specific management areas. In general, the proposed activities Resource Area-wide and in the management areas are not substantively different from current practices. The major differences between the existing condition and the Draft RAMP are the efforts to encourage a safe and enjoyable recreational experience for the user and to emphasize public education about OHV use in the context of the recreational/cultural/and biological resources of the area. Where facilities are planned and law enforcement is planned to be increased, these actions are proposed to ensure the public's health and safety in the context of an enjoyable recreational experience.

2.4 Management Measures

The ISDRA is located on the eastern edge of Imperial County (Figure 1-1). The area includes the largest mass of sand dunes in California and provides some of the most unique OHV recreational opportunities in the desert Southwest. The dunes are more than 40 miles in length have an average width of 5 miles. The dune system is currently divided into three areas: (1) the northern-most area is referred to as Mammoth Wash; (2) the North Algodones Dunes Wilderness, established by the 1994 California Desert Protection Act, is south of Mammoth Wash (this area is closed to mechanized use and access is by hiking and horseback); and (3) the largest and most heavily used area of the ISDRA begins at SR-78 and continues south just past Interstate (I) 8 to the Mexican Border. Under the Draft RAMP, the ISDRA would be delineated into nine management areas.

The Draft RAMP emphasizes a management approach that is based on the management goals identified above, with a specific emphasis on recreation-based management. The recreational setting is used to determine the level of development; the types of facilities that are appropriate; and, ultimately, the type of recreational opportunity that one will experience. Table 2-1 is a summary of the Draft RAMP Resource Area management activities.

Table 2-1 Draft RAMP Resource Area Management Activities

Recreation	<ul style="list-style-type: none"> • Maintain and manage ISDRA as a unique locale providing rural, roaded-natural, and semi-primitive OHV recreation opportunities in the desert southwest • Accommodate OHV enthusiasts in the ISDRA without displacing the activity into less intensively used areas within the El Centro Field Office (ECFO) management area • Control OHV congregation areas in a way that provides safety for the OHV enthusiast and personnel • Adaptively manage OHV recreation to meet ROS settings on nonholiday weekends, accommodate ROS settings changes
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Table 2-1 Draft RAMP Resource Area Management Activities

	during the six major holidays that vary from nonholiday management actions
Public Outreach	<ul style="list-style-type: none"> • Develop a public relations program on safety and design and implement interpretive displays and brochures • Develop cultural resources education program • Develop relationship with OHV organizations
Biological Resources	<ul style="list-style-type: none"> • Implement a biological monitoring program, including adaptive management for species of concern in the ISDRA. (see Appendix 1 of RAMP)
Air Quality	<ul style="list-style-type: none"> • Implement dust control measures in certain areas • Install air meters for ozone/PM₁₀ in ISDRA
Transportation/ Traffic	<ul style="list-style-type: none"> • Grade roads • Implement fee entry and construct traffic control
Public Health and Safety	<ul style="list-style-type: none"> • Create a law enforcement cooperative team • Increase permanent staff and holiday staff • Ban alcohol outside camping areas • Establish a sundown to sunup closure at Competition Hill north and south, Oldsmobile Hill, Test Hill, and Patton Valley • Post speed limits (see Chapter III of Draft RAMP for locations and speeds) • Develop/maintain radio system • Continue existing condition of dispatching duties from Cahuilla Ranger Station
Visitor Use	<ul style="list-style-type: none"> • Conduct a three-part monitoring study: <ul style="list-style-type: none"> - Data collection on types of vehicles entering the dunes, number of people in vehicles, and the types of OHV vehicles being brought to the dunes. - Count vehicles entering the ISDRA - Conduct demographic studies to obtain data on the willingness-to-pay and actual expenditure data by OHV recreation visitors under different adaptive management regimes • If visitation exceeds the supply over 15 percent of the season, capacity will be limited to ensure ROS management objectives are met • If visitation exceeds supply over 20 percent of the season or 15 percent of the season for 2 consecutive years, more restrictive actions will be considered to limit access to the recreation area • Each management area has a visitor capacity that will be met 50 percent of the visitor season (October 1 through May 31)
Land Use	<ul style="list-style-type: none"> • Establish management areas with specific ROS classifications to meet planning objectives

Table 2-1 Draft RAMP Resource Area Management Activities	
Commercial	<ul style="list-style-type: none"> • Vending allowed October 1 through May 31 on Friday through Sunday (exceptions made for major holidays) • Nonrecreational commercial activities not allowed during the holidays
Access and Facilities Development	<ul style="list-style-type: none"> • Develop or retrofit facilities, in the appropriate ROS classes, to accommodate visitation and meet all disability regulations and standards • Ensure that little or no development occurs in primitive areas • Construct disability compliant trash collection facilities (and loading docks)
Fiscal	<ul style="list-style-type: none"> • Collect fees in all areas based on demand and cost recovery • Review price structure every 2 years • Update fee business plan within 2 years of ROD
Source: EIS (BLM 2002)	

2.5 Individual Management Areas

This section summarizes the Draft RAMP individual management areas of the ISDRA. Actions specific to these areas are noted, where applicable, when they provide greater detail than the general Resource Area actions (see Table 2-1) or when the ISDRA measures are not applicable to a management area. Greater detail on the Draft RAMP and the measures in the individual management areas is in the RAMP (Chapter III).

2.5.1 Mammoth Management Area and Management Measures

The proposed ROS for the Mammoth Management Area is Semi-Primitive Motorized. Under the Draft RAMP, conserving and protecting natural and cultural resources, including threatened and other sensitive plants and animals, will be emphasized. OHV recreational opportunities for small groups and other individuals that seek solitude with relatively low concentrations of OHV use will be allowed. The management focus will ensure that the semi-primitive characteristics of the area remain intact. Specific management actions that would be implemented in this area under the Draft RAMP are:

- Allow OHV recreation in accordance with the ROS
- Establish visitor use ranges to achieve low OHV use and retain semi-primitive characteristics
- Conduct recreation satisfaction survey
- Aggressive outreach program on habitat/conservation protection
- Establish environmental ethics program
- Patrol by rangers not on a regular basis
- No road improvement planned

- No commercial events except photography or filming permits
- No facilities planned or allowed

2.5.2 North Algodones Dunes Wilderness Management Area and Management Measures

For this management area, the Draft RAMP would not differ substantively from the existing condition because the North Algodones Dunes Wilderness Management Area would remain be maintained as a wilderness. It would be managed under the Semi-Primitive Non-Motorized ROS classification. A predominantly natural or natural-appearing environment of moderate to large size (generally larger than 2,500 acres) characterizes this setting. Currently, motorized access into this area is allowed for law enforcement activities and for the maintenance of wildlife guzzlers. Occasionally, others trespass into this area with motorized vehicles. The amount of motorized trespasses in this area should be reduced. Specific management actions that would be implemented in this area under the Draft RAMP are:

- A low visitor density would be established
- Update kiosks at watchable wildlife site
- No motorized access allowed except law enforcement and to maintain wildlife guzzlers (The amount of motorized trespasses in this area should be reduced.)

2.5.3 Gecko Management Area and Management Measures

The Gecko Management Area currently is the most developed management area in the ISDRA; and it includes Gecko Road, all the adjacent pads and campgrounds, and the Osborne Overlook area. The existing affected facilities include roads, campgrounds, toilets, trash stations, camping pads, overlooks, information kiosks, commercial vending, and a ranger station. In this area, facilities for intensified motorized use and camping already exist.

The Cahuilla Ranger Station, which is located adjacent to Gecko Road just south of SR-78, comprises a visitor area, medical room, break room, offices, and employee restrooms all housed in a triple-wide trailer. There are two single-wide trailers that are used as housing for the onsite emergency medical technician (EMT) and Law Enforcement Ranger. There is a storage shed for equipment and vehicles, several cargo containers, and a weather station. The entire area is fenced with a portion of the lot designated as a helipad.

Under the Draft RAMP, the Cahuilla Ranger Station would remain as the main area of operations for the BLM's entire ISDRA operations and as the designated location for visitors to seek assistance. It would be managed under the ROS Rural classification. Specific management actions that would be implemented in this area under the Draft RAMP are:

- Eliminate camping between the canals and north of SR-78
- Increase amount of camping area on Gecko Road to consolidate camping and avoid dispersed camping

- Use camping areas between the canals for overflow capacity
- Develop pilot reservation program in Roadrunner Campground
- Close Osborne Overlook to camping
- Install kiosks and interpretive areas at Osborne Overlook and near public phones at Gecko Road, Gecko Campground, Roadrunner Campground
- Increase law enforcement rangers on weekends
- Add one emergency medical service (EMS) rescue buggy
- Restrict commercial filming to avoid conflicts with recreation use
- Tie product vending to those that benefit OHV recreational experience
- Allow vending as described in the RAMP
- Designate commercial vehicle weight limit
- Grade and treat access roads between canals with dust palliative
- Implement traffic control at Gecko Rd and at intersection of Gecko Road and SR-78
- Implement fee entry and construct traffic control area at Gecko Road
- Construct ranger station at Osborne Overlook
- Resurface and maintain Osborne Overlook
- Construct parking lot at base of Osborne Overlook
- Construct maintenance shed at Ranger station
- Construct fuel station for BLM use
- Remove residence/ranger station trailer, replace with permanent housing
- Construct additional housing/parking facilities for BLM staff
- Implement fee entry and construct traffic control area at Gecko Road

2.5.4 Glamis Management Area and Management Measures

The Glamis Management Area would be managed under the ROS Roaded Natural classification, which emphasizes a natural appearing environment. Facilities would be designed and constructed to accommodate conventional motorized use. Currently, this area is used for camping, OHVs, and commercial vending. It also contains rights-of-way use. The level of use on nonholiday weekends is moderate, increasing to high on holiday weekends. Specific management actions that would be implemented in this area under the Draft RAMP are:

- Allow camping east of Glamis and the UPRR tracks
- Apply and maintain dust palliative on the wash road

- Grade the roads regularly
- Construct pit toilets in Glamis Flats and Washes areas
- Close Oldsmobile Hill and Competition Hill from sundown to sunup

2.5.5 Adaptive Management Area and Management Measures

The Adaptive Management Area has the most widely diverse habitat in the ISDRA, and historical recreational use of the area is low to moderate (i.e., use is limited to the OHV fuel capacity). It would be managed under the Semi-Primitive Motorized ROS classification. The Adaptive Management Area would be managed to provide recreational opportunities while allowing for the conservation of habitat and plants and species of concern. Specific management actions that would be implemented in this area under the Draft RAMP are:

- Access allowed via permit only; requires driver to pass a resource conservation exam
- No facilities or commercial activity allowed
- Establish a focused biological monitoring program (see RAMP, Appendix 1)
- Interpretive signs allowed
- Visitor use limited to 75 OHV groups (7 vehicles per OHV group) per day (a maximum of 525 vehicles per day)

2.5.6 Olgilby Management Area and Management Measures

The Olgilby Management Area is currently used for camping, OHVs and rights-of-way and is characterized by low use on nonholiday weekends, with moderate use on holiday weekends. This area would be managed under the Roaded Natural classification of the ROS spectrum. Management actions would focus on protection of natural, cultural, scenic, ecological resources, including threatened and endangered species. This management objective would allow OHV-recreational opportunities for families and other groups that seek an area within the ISDRA offering low-to-intense concentration of OHV recreation activity. Minimal restrictions will be placed on the groups that recreate within the management area. Specific management actions that would be implemented in this area under the Draft RAMP are:

- Allow camping and OHV use
- No road improvements implemented
- No recreational facilities or other developments constructed
- Implement aggressive outreach programs for habitat conservation and resource protection

2.5.7 Dune Buggy Flats Management Area and Management Measures

The Dune Buggy Flats Management Area is located north of I-8 along the western border of the Plan Area. This area is currently used for camping, OHVs, commercial vending, and rights-of-way. Under the Draft RMP, this area would be managed under the Roaded Natural classification of the ROS spectrum. Specific management actions that would be implemented in this area under the Draft RAMP are:

- Apply and maintain dust palliative on the wash road
- Grade the entrance roads
- Construct pit toilets

2.5.8 Buttercup Management Area and Management Measures

The Buttercup Management Area would be managed under the Rural classification under the ROS. This area is currently used for camping, OHVs, sightseeing, commercial vending, education, filming, and rights-of-way. Specific management actions that would be implemented in this area under the Draft RMP are:

- Designate camping sites based on results of pilot test at Gecko Management area
- Designate interpretive area near Greys Well Road with parking and facilities
- Construct semipermanent ranger station (EMS room, toilets, water well, parking, septic, storage)
- Construct semipermanent law enforcement facility (parking and helipad, storage area)
- Construct interpretive facilities near Greys Well Road
- Repair fencing around Plank Road
- Repair/update all Plank Road exhibits
- Build parking for busses on Greys Well Road with pit toilets
- Commercial allowed with additional construction for parking/rangers

2.5.9 Buffer Zone Management Area and Management Measures

The Buffer Zone Management Area is outside the ISDRA but is included in the Draft RAMP. This management area would provide a 1-mile buffer zone around the ISDRA boundary, the intent of which is to reduce the potential effects of the ISDRA-related activities on property outside the ISDRA boundary. The area encompasses sand and gravel mining, military bombing ranges, private lands, and management areas for the desert tortoise and the flat-tailed horned lizard. The BLM currently manages lands within this management area as limited access or closed, and this approach would continue under the Draft RMP. This area is currently used for mining, OHVs, camping, hunting, rights-of-way, and military exercises. Specific management actions that would be implemented in this area under the Draft RAMP are:

- No camping allowed
- Motorized recreation limited to existing roads and trails
- Add signage on no camping/road use

2.6 Biological Resource Goals and Objectives of the RAMP

The management plan contains two primary goals for the ISDRA regarding biological resources:

- Maintain viable populations of all native species throughout ISDRA. The ISDRA contains unique species of plants, invertebrates, and wildlife each with its own unique habitat requirements. The monitoring of threatened or listed species, as well as the monitoring of highly visible indicator species such as the fringe-toed lizard or giant Spanish needle, will be used to measure the health of the habitat. The plan is to monitor a representative group of species to determine the viability of the native species as a whole.
- Maintain habitat connectivity throughout the ISDRA. The purpose of this goal is to limit habitat fragmentation and maintain transfer of genetic material from all subpopulations throughout the ISDRA. Such genetic transfer is essential to maintaining viable populations.

The biological resources management objectives are:

- Ensure the continued existence of all native species in each management area where appropriate habitat exists naturally
- Maintain habitat continuity between management areas
- Monitor native species as described in Appendix 1 of the Draft RAMP

2.7 RAMP Monitoring Plan

Appendix 1 of the RAMP provides the methodology to monitor species of concern in the ISDRA. This annual monitoring of Peirson's milk-vetch to estimate density (number of plants/unit area) and population size. Appendix 1 provides the methodology to monitor species of concern in the ISDRA. Through monitoring and analysis of the monitoring data, BLM will determine the impacts to species of concern due to recreational use of the ISDRA. Management of recreational use, especially in the adaptive area, will be evaluated periodically in light of the results of this monitoring, and revised as needed to achieve a balance of providing a high level recreational area and conserving species of concern.

For Peirson's milk-vetch, as well as Algodones Dunes sunflower (*Helianthus niveus* ssp. *Tephrodes*) and sand food (*Pholisma sonora*), estimates will be made separately for the Mammoth Wash area, North Algodones Wilderness, Open Area south of SR-78 and north of Adaptive Management Area, Adaptive Management Area, and Open Area south of Adaptive Management Area. These estimates can also be combined into a single estimate for the entire ISDRA using the appropriate formula for stratified random sampling. The analysis of the yearly monitoring is described in detail in the RAMP.

Psammophytic and desert microphyll woodland vegetation will also be monitored. For psammophytic vegetation, both the cover and density of perennial plants will be estimated annually. Changes in total vegetation cover and the cover of at least the most dominant species would be analyzed. Monitoring of desert microphyll woodland vegetation would be conducted annually, but monitoring of specific areas would be done on a 5-year rotation using the protocol currently being developed by BLM to monitor riparian and wetland vegetation desertwide. It is expected that this protocol will be finalized in time for monitoring in spring 2003. Monitoring to estimate the density of Colorado Desert

fringe-toed lizards (*Uma notata*) in a comparison of open and closed areas in terms of OHV use would be continued.

The analysis will compare responses between areas (particularly between the wilderness area and the Adaptive Management Area) and determine whether responses are *parallel* with one another (i.e., a decline in the population size in the Adaptive Management Area is mirrored by a similar decline in the wilderness area or an increase in the Adaptive Management Area is accompanied by a similar increase in the wilderness area). If the responses are not parallel, the BLM will then look for a reason. The reason could be OHV use in the Adaptive Management Area, different amounts of growing season precipitation in the two areas, or a combination of both. Weather station data (discussed in Appendix 1 of the RAMP) will be examined to determine if the lack of parallel response is due to rainfall. OHV use data will also be examined to determine if an increase or decrease in OHV use levels is responsible for the difference.

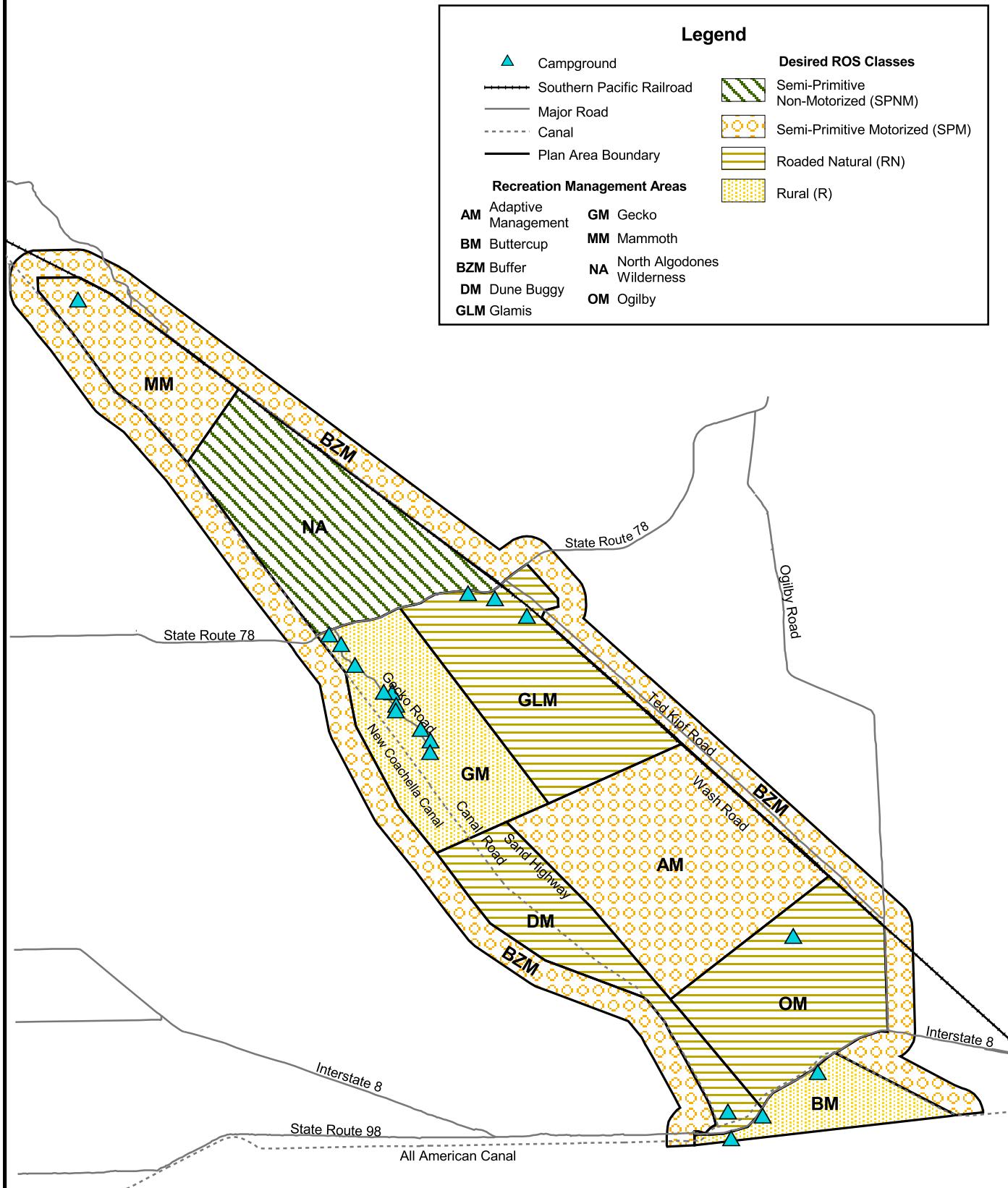


Figure 2-1
Proposed Action

Imperial Sand Dunes Recreation Area - Biological Assessment

0 2 4 6 Miles



3.0 Affected Environment

The ISDRA Plan Area is located within the Colorado Desert where climate, topography, soils, vegetation, and wildlife are characteristic of this arid environment. This section describes the climate, geological resources, water resources, and biological resources of the Plan Area.

3.1 Climate

The climate at the ISDRA consists of hot summers, mild winters, low rainfall, low relative humidity, and a high percentage of sunny clear days. Summer daytime temperatures routinely exceed 105 degrees Fahrenheit (°F). Winter daytime highs are 60 to 70°F from December through March. Annual precipitation fluctuates widely but averages just over 2 inches. Winds may exceed 50 miles per hour (mph) and generally approach from the northwest in the winter and southeast in the summer.

3.2 Geology

The Imperial Sand Dunes is situated on a relatively flat plain. The plain has an elevation of approximately 50 feet above mean sea level. This subsection will address geological resources including the dune system and soils at the Plan Area.

3.2.1 Dune System

The system is comprised of a variety of dune types known as draas, linear, parabolic, barchan, and zibars. These dunes are separated occasionally by inter-dune areas, where relatively little sand accumulates into dune formations. The dune system lies on an alluvial fan emanating from the Cargo Muchacho and Chocolate Mountains.

The dunes may reach heights of 300 feet above the plain, and include classic examples of several different types of dune morphology. The sand dunes are thought to have originated from the beach sands of ancient Lake Cahuilla, a waterbody created by episodic diversions of the Colorado River into the valley instead of the Gulf of California. The Imperial Sand Dunes have formed as a result of opposing seasonal winds. Winter winds come from the northwest, but often reverse to the southeast in summer. Most sand movement occurs during high winds, which usually are not long-lasting events. While dune deposits are constantly reshaped during high winds, sand particles generally move a short distance. Although there are components of sand movement in various directions during seasonal prevailing winds, the overall transport direction is to the southeast.

The east and west boundaries of the dune system differ substantially in character. Sands found to the west are composed of material that is generally heavier and coarser than the lighter, finer sands carried further east in the prevailing winds. The coarse sands form the largest and tallest dunes, which are located in the western two-thirds of the dune system. These constitute the “primary dunes.” East of the primary dunes are the “secondary

dunes,” which are smaller dunes composed of finer sands and having more vegetative cover.

3.2.2 Soils

The dunes are composed of sand that is 60 to 70 percent quartz, 30 to 40 percent feldspar with very minor amounts of biotite, magnetite, garnet, and epidote. A large percentage of the grains are coated with ferric oxide, resulting in a pale orange cast to the sand. A majority of the sand grains are subrounded to subangular. Grain size decreases from west to east across the dunes indicating the source is from the west.

The U.S. Department of Agriculture (USDA) soil survey for Imperial County classified the dune sand as “Rositas fine sand.” Typically, Rositas soil is a reddish-yellow fine sand that reaches a depth of 60 inches. This soil is somewhat excessively drained where the effective rooting depth is 60 inches or more. The USDA identified the soils as having little potential for farming, home sites, and urban areas.

3.3 Water Resources

Major water bodies in the extended vicinity of the Plan Area include the Salton Sea and Colorado River. There are limited water resources in the immediate vicinity of the ISDRA. This subsection will address water resources including surface waters and ephemeral washes at the Plan Area.

3.3.1 Surface Waters

There are two manmade surface waterways in the vicinity of the dunes, the All American Canal and the New Coachella Canal. The All American Canal has a bottom width of approximately 160 feet and depth of about 21 feet. The canal is lined with clay to minimize seepage. The capacity of the canal is 10,155 cubic feet per second (cfs) in the vicinity of the Imperial Sand Dunes. Although the All American Canal is lined, a substantial amount of water is believed to be lost through seepage. The New Coachella Canal is connected to the All American Canal at what is known as Drop 1 in the eastern portion of the Plan Area. The Coachella Canal, originally completed in 1949 as an unlined channel, had a flow capacity of approximately 2,500 cfs. The canal extends northwesterly from Drop 1 for approximately 123 miles and runs along the east side of the Salton Sea and west of the Plan Area. The first 48 miles of the original Coachella Canal were replaced with a new canal called the New Coachella Canal in the early 1980s due to concerns about water loss through seepage in the East Mesa area. The original Coachella Canal has been abandoned.

The 48-mile New Coachella Canal has a flow capacity of approximately 1,550 cfs and is concrete lined to prevent seepage. Operating roads are located along either side of the new canal. The New Coachella Canal has a bottom width of approximately 16 feet and ranges in depth from 10 to 12 feet.

Seepage from the Old Coachella Canal provided a water source and habitat along the canal that supported various forms of wildlife. With construction and operation of the concrete lined New Coachella Canal and the subsequent abandonment of the southern portion of the Old Coachella Canal, wildlife became displaced. To partially mitigate the loss of habitat and prevent any further drowning of wildlife that became entrapped in the canal, the California

Department of Fish and Game (CDFG) installed four water wells in the North Algodones Wilderness Area and two water wells in the Mammoth Wash Area. Windmills were installed to pump the water into wildlife guzzlers. The guzzlers have created limited wetland and green areas within the Plan Area that not only provide a source of water but habitat and forage for wildlife.

3.3.2 Ephemeral Washes

From the north and east, the Chocolate and Cargo Muchacho Mountains drain into an alluvial fan containing numerous ephemeral washes that terminate at the eastern boundary of the ISDRA. The surface flows and pools generally occur in the winter and spring seasons of wet years, but can occur at other times. The water does not remain on the surface for long periods following rains due to the porous nature of the soils. The ephemeral washes provide an important water source needed to support the microphyll woodland habitat and numerous wildlife species along the eastern boundary of the ISDRA.

3.4 Biological Resources

This subsection describes habitat types as background information on the Peirson's milk-vetch, desert tortoise, and flat-tailed horned lizard.

3.4.1 Habitat Types

The biological resources of the Plan Area include several habitat types that support a variety of plant and wildlife species, including special-status, sensitive, rare, and endemic species. The primary habitat types found within the Imperial Sand Dunes include creosote bush scrub, psammophytic scrub, microphyll woodland, and canal-influenced vegetation. These habitats are depicted in Figure 3-1.

3.4.1.1 Creosote Bush Scrub

Creosote bush scrub is the most common habitat type in the Colorado Desert and typically occurs on well-drained secondary soils of slopes, fans, and valleys. Within the ISDRA, this habitat type occurs within the relatively stable soils along the periphery of the dune system. It rarely occurs in the central portion of the ISDRA where shifting dunes are prevalent. This habitat type is generally characterized by relatively barren ground between widely spaced shrubs. To the west of the ISDRA, the habitat consists of almost pure stands of creosote bush. On the eastern boundary of the ISDRA, this community is more diverse due to the topographic relief of the dunes and runoff from the nearby Chocolate and Cargo Muchacho Mountain ranges. The creosote bush scrub vegetation within the alluvial fan between the desert washes forms a transitional zone with the microphyll woodland habitat.

Characteristic plant species that primarily comprise this habitat type include creosote bush (*Larrea tridentata*), brittlebush (*Encelia farinosa*), and burrobrush (*Ambrosia dumosa*). Less abundant species that are associated with this habitat type include woolly desert marigold (*Baileya pleniradiata*), birdcage evening-primrose (*Oenothera deltoides*), dyebush (*Dalea emoryi*), longleaf jointfir (*Ephedra trifurca*), desert thorn-apple (*Datura discolor*), big galleta (*Hilaria rigida*), white rhatany (*Krameria grayi*), and brown plume wirelettuce (*Stephanomeria pauciflora*).

The wildlife commonly associated with this habitat type include desert iguana (*Dipsosaurus dorsalis*), zebra-tailed lizard (*Callisaurus draconoides*), western whiptail lizard (*Cnemidophorus tigris*), Red-tailed Hawk (*Buteo jamaicensis*), Mourning Dove (*Zenaidura macroura*), Lesser Nighthawk (*Chordeiles acutipennis*), Black-tailed Gnatcatcher (*Polioptila melanura*), Yellow-rumped Warbler (*Dendroica coronata*), White-crowned Sparrow (*Zonotrichia leucophrys*), big brown bat (*Eptesicus fuscus*), kit fox (*Vulpes macrotis*), roundtail ground squirrel (*Spermophilus tereticaudus*), and black-tailed hare (*Lepus californicus*). Special-status or sensitive wildlife species that may occur in this habitat include desert tortoise, flat-tailed horned lizard, Western Burrowing Owl (*Athene cunicularia*), and LeConte's Thrasher (*Toxostoma lecontei*). The endemic Hardy's dune beetle (*Anomala hardyorum*) and Carlson's dune beetle (*Anomala carlsoni*) are also found in this habitat type (Hardy and Andrews, 1979).

3.4.1.2 Psammophytic Scrub

Psammophytic ("sand loving") scrub occurs within the interior dune system where active and partially stabilized dunes are found. This habitat type is typically situated between active dunes in depressions that are commonly termed "bowls." The soils in these areas consist primarily of fine sand. As the dunes shift from year to year, the bowls generally shift as well. Vegetation is adapted to relatively high sand mobility and deep water percolation. Most of these plant species are capable of rapid growth given favorable soil moisture conditions.

Common plants of this habitat type include Mormon tea (*Ephedra nevadensis*), desert buckwheat (*Eriogonum deserticola*), desert dicoria (*Dicoria canescens*), common sandpaper plant (*Petalonyx thurberi*), desert panicum (*Panicum urvilleanum*), and plicate coldenia (*Tiquilia plicata*). Additionally, birdcage evening primrose and desert lily (*Hesperocallis undulata*) may occur in the relatively stable dunes that form a transitional zone with the creosote bush scrub habitat. Special-status, rare, or sensitive plant species that are known to occur in this habitat include Peirson's milk-vetch, Algodones Dunes sunflower (*Helianthus niveus* ssp. *tephrodes*), Wiggins' croton (*Croton wigginsii*), giant Spanish needle (*Palafoxia arida* var. *gigantea*), sand food (*Pholisma sonora*), and Borrego milk-vetch (*Astragalus lentiginosus* var. *borreganus*).

The wildlife commonly associated with psammophytic scrub include Black-tailed Gnatcatcher, Mourning Dove, Cliff Swallow (*Hirundo pyrrhonota*), coyote (*Canis latrans*), roundtail ground squirrel, desert kangaroo rat (*Dipodomys deserti*), and black-tailed hare. The Colorado desert fringe-toed lizard (*Uma notata*) is the only sensitive wildlife species known to almost exclusively inhabit this area. The endemic Andrew's dune scarab beetle (*Psuedocotalapa andrewsi*) is also found in this habitat type (Hardy and Andrews, 1979).

3.4.1.3 Microphyll Woodland

To the east of the dune system is a large alluvial fan draining the Chocolate and Cargo Muchacho Mountains. The alluvial fan is dissected by numerous ephemeral washes and separated by expansive, level interfluvies. The desert microphyll woodland typically is best developed in the larger drainages where dense stands of a variety of trees occur. Microphyll woodland is generally found along the margins of these dry channels, and around the cul-

de-sac sinks of their terminii. Vegetation is generally sparse in the open wash areas between the sinks.

Characteristic plants of this habitat type include palo verde (*Cercidium floridum*), ironwood (*Olneya tesota*), smoke tree (*Psoralea arguta*), and to a lesser degree honey mesquite (*Prosopis glandulosa*), desert willow (*Chilopsis linearis*), desert unicorn plant (*Proboscidea altheaefolia*) and big galleta. Depending upon rainfall, the understory in the plains is generally composed of shrubs and annuals such as desert starvine (*Brandegea bigelovii*), carrizo mallow (*Sphaeralcea orcuttii*), California threeawn, Mediterranean grass (*Schismus barbatus*), lineleaf white puff (*Oligomeris linifolia*), and rush milkweed (*Asclepias subulata*).

The plant diversity and relative density, combined with the micro-topographic variability associated with the washes, accounts for a high diversity of wildlife in the microphyll woodland. Wildlife commonly associated with this habitat type include side blotched lizard (*Uta stansburiana*), western whiptail lizard, zebra-tailed lizard, sidewinder rattlesnake (*Crotalus cerastes*), Red-tailed Hawk, Gambel's Quail (*Lophortyx gambelli*), Mourning Dove, Ladder-backed Woodpecker (*Picoides scalaris*), Verdin (*Auriparus flaviceps*), Western Flycatcher (*Empidonax difficilis*), Cactus Wren (*Campylorhynchus burnnei-capillus*), Warbling Vireo (*Vireo gilvus*), Wilson's Warbler (*Wilsonia pusilla*), House Finch (*Carpodacus mexicanus*), Black-tailed Gnatcatcher, and White-crowned Sparrow (*Zonotrichia leucophrys*), western pipistrelle bat (*Pipistrellus hesperus*), coyote, kit fox, mule deer (*Odocoileus hemionus*), white-tailed antelope squirrel (*Ammospermophilus leucurus*), black-tailed hare, and desert cottontail (*Sylvilagus audubonii*). Special-status or sensitive wildlife species that may occur in this habitat include desert tortoise, Couch's spadefoot toad (*Scaphiopus couchi*), Gila Woodpecker (*Melanerpes uropygialis*), Western Burrowing Owl, and LeConte's Thrasher.

Wildlife guzzlers were installed by the CDFG to partially mitigate impacts from the construction of the New Coachella Canal. The guzzlers have created limited herbaceous weedy vegetation within the microphyll woodland. The presence of water and forage around the guzzlers has attracted mule deer from the Chocolate Mountain range. Mule deer are known to use the microphyll woodland associated with the washes as corridors through the Algodones Dunes Wilderness Area and into the southern part of the Mammoth Wash area. It is thought that the Yuma puma (*Felis concolor browni*) has followed the deer into the woodland to feed upon this important prey species.

3.4.1.4 Canal-Influenced Vegetation

Both the Coachella and All American Canals support hydrophytic vegetation that is subject to periodic eradication efforts. Although the canals are lined, some seepage occurs and promotes the growth of hydrophytic vegetation. Submergent and upland species include shortspike watermilfoil (*Myriophyllum exalbescentis*) and fennel-leaf pondweed (*Potamogeton pectinatus*). Emergent species include cattails (*Typha* spp.), spotted cadythumb (*Polygonum fusiforme*), horsetweed (*Conyza canadensis*), spiny chloracantha (*Aster spinosus*), giant reed (*Arundo donax*), small-flowered tamarisk (*Tamarix parviflora*), false daisy (*Eclipta alba*), common sunflower (*Helianthus annuus*), white sweetclover (*Melilotus albus*), and arrow weed (*Pluchea sericea*).

This manmade habitat is utilized by a variety of birds including American Coot (*Fulica americana*), Red-wing Blackbird (*Agelaius phoeniceus*), Yellow-headed Blackbird

(*Xanthocephalus xanthocephalus*), Common Yellowthroat (*Geothlypis trichas*), and Marsh Wren (*Cistothorus palustris*). Common mammals that occur in this habitat include black-tailed hare, coyote, raccoon (*Procyon lotor*), and American badger (*Taxidea taxus*).

3.4.2 Species Accounts

3.4.2.1 Peirson's Milk-vetch

Status

Peirson's milk-vetch was proposed as endangered in 1992 and listed as threatened in 1998 (Federal Register, 1998). It is also recognized as endangered by the State of California and as a special status species by the BLM. The California Native Plant Society (CNPS) lists the milk-vetch as a category 1B (rare, threatened, or endangered in California and elsewhere throughout its range) (Tibor, 2001). Critical habitat has not been designated for this species, and a recovery plan has not been produced by the USFWS.

Life History

Peirson's milk-vetch is a short-lived perennial reaching 8 to 30 inches high. The stems and leaves are pubescent, and the leaves are 5 to 15 centimeters (cm) long. The flowers are dull purple and are arranged in 10 to 17 flowered racemes. The resulting seed pods are 0.8 to 1.5 inches long and are inflated with a triangular beak (Bowers, 1996).

This species is able to become reproductive in a single season. It generally completes seed production by June. By July, the plant has dropped many of its leaflets and some entire leaves. This condition may persist from July to October. Seedlings may be present in December, although not in great numbers. Seedlings that germinate by November or December may reach the flowering or fruiting stage by March (Romsper and Burk, 1979).

Seeds of the Peirson's milk-vetch are the largest of any North American milk-vetch species (Barneby, 1964). Within this genus, the large seeds are thought to be better adapted to active dunes than small seeds. This may be due to the larger food reserves enabling them to emerge even when deeply buried (Bowers, 1996). Harper et al. (1970), however, noted that a trade-off exists between seed size and seed numbers such that large-seeded plants typically produce fewer seeds.

Chadwick & Dalke (1965) pointed out that soil water is more readily available to plants in sand than in clay, which may facilitate seed imbibition and germination. Moreover, even during drought, dune sand retains moisture at depths greater than 12 inches (Shreve, 1938; Chadwick & Dalke, 1965; Sharp, 1966; Prill, 1968; Bowers, 1982). This literature suggests that seedlings such as the Peirson's milk-vetch capable of rapid root elongation might readily survive seasonal drought conditions.

Romsper and Burk (1979) noted in their study that seed viability of the Peirson's milk-vetch remained high for at least 1 year under laboratory storage conditions. This plant also required no pregermination treatment and showed increased germination success when the seeds were scarified. Scarification was accomplished in a laboratory setting through tumbling with sand from the dunes. Within this same setting, milk-vetch seeds germinated best at lower and intermediate temperatures (60 to 77°F).

Peirson's milk-vetch seeds are transported within inflated pods that are dispersed by winds across the dunes where they may come to rest within vegetation or depression. Many of the seeds fall prey to the seed beetle family. This contributes to a high mortality of seeds and reduced seed crop for this species (Romspert and Burk, 1979).

Peirson's milk-vetch habitat consists of sandy depressions at the base of high dunes and lower established dunes. This species does not extend many lateral roots and, therefore, is more susceptible if the main stem is broken. The susceptibility of the adult plants in conjunction with the period of seedling establishment during the cooler months, which coincides with the higher usage of the dunes by OHVs, makes this species sensitive to impacts (Romspert and Burk, 1979).

Distribution and Occurrence within the Plan Area

Peirson's milk-vetch, an obligate psammophyte, grows on the slopes and hollows of wind-blown dunes in the Colorado and Sonoran deserts. According to Barneby (1964) and Wiggins (1980), it is known from the Imperial Sand Dunes in Imperial County, which extend south of the International Border into northeastern Baja, California. Additionally, the milk-vetch is known to occur in the Gran Desierto in Sonora, Mexico (Felger, 2000). Although it has been reported from Borrego Valley, San Diego County, California, it has not been observed there for several decades (Tibor, 2001).

The only location where the Peirson's milk-vetch is currently known to occur within the United States is the Imperial Sand Dunes, which supports between 75 and 80 percent of all of the world's known colonies of the species (Federal Register, 1998). The milk-vetch is associated with psammophytic scrub habitat within these dunes. The plant is generally scattered throughout the dune complex with a higher abundance of the plant along the central and western aspect of the Imperial Sand Dunes. Figures 3-2, 3-3, 3-4, and 3-5 depict the distribution and abundance of the Peirson's milk-vetch at the ISDRA.

In 1998, the BLM initiated a monitoring study of six special-status plant species including the Peirson's milk-vetch at the Imperial Sand Dunes. Monitoring was conducted in spring and summer 1998, spring 1999, and spring 2000 (Figures 3-2, 3-3, and 3-4). The study was designed to allow comparisons of plant abundance and distribution among these years. To summarize the results, the Peirson's milk-vetch was abundant in 1998, the highest rainfall year, and least abundant in 2000, the lowest rainfall year. The study is presented in *Monitoring of Special-Status Plants in the Algodones Dunes, Imperial County, California* (BLM, 2001).

In 2001, the American Sand Association (ASA) retained the services of Thomas Olsen Associates, Inc. (TOA) to provide an independent assessment of the abundance, distribution, and life history of the Peirson's milk-vetch at the Imperial Sand Dunes. Data were also collected on five other dune plant species as well. Unlike the BLM monitoring effort, this study was designed to obtain an actual plant census. A total of 71,926 individual milk-vetch plants was recorded during the course of this survey (Figure 3-5). Occurrences of Peirson's milk-vetch were generally clustered and distributed west of the primary dunes in association with the western line of the intermediate active dunes. The distribution of the milk-vetch was considered dependent on the geomorphology of the dunes. Plants were concentrated in areas where there was relative substrate stability. These areas were generally located on the lee side of the large dunes in areas where the surface gradually

slopes upwards from deep or shallow basins at the base of steep slip faces. This studies results were presented in *Biology, Distribution, and Abundance of Peirson's Milkvetch and Other Special Status Plants of the Algodones Dunes, California* (TOA, 2001).

Threats

OHV use and associated recreational development have been described as the primary threat to Peirson's milk-vetch through destruction of individual plants and habitat (Luckenbach and Bury, 1983; ECOS, 1990; Federal Register, 1998).

3.4.2.2 Desert Tortoise

Status

The Mojave population of the desert tortoise was emergency listed by the USFWS as an endangered species in 1989. Under final rule, this population was federally listed as threatened in 1990 (Federal Register, 1990). The State of California listed this species as threatened in 1989. The BLM recognizes the desert tortoise as a special-status species. Currently, the BLM is drafting several management plans including the West Mojave Coordinated Management Plan (WEMO), Northern and Eastern Mojave Coordinated Management Plan (NEMO), and Northern and Eastern Colorado Coordinated Management Plan (NECO) with an important focus on the management and conservation of the desert tortoise. A final recovery plan was completed by the USFWS in 1994 (USFWS, 1994). Critical habitat was designated in 1994 (Federal Register, 1994). The Chuckwalla Bench Critical Habitat Unit (CHU) is located less than 5 miles northeast of the ISDRA.

Life History

The desert tortoise is a large herbivorous terrestrial reptile. It has a high domed shell that may reach a length of 15 inches or more. The animal has stocky, elephant-like limbs and a short tail. The carapace (upper shell) is brown and the plastron (lower shell) is yellow in color, both exhibiting prominent growth lines. Adult males can be distinguished from females by the concavity in their plastron. Adult males also have larger chin glands and a longer tail and gular horn than females (Stebbins, 1985).

The adult desert tortoise is active from mid-March or April to November, and during the winter months is dormant in underground burrows (Luckenbach, 1982; Zimmerman et al., 1994). Desert tortoises will congregate in winter dens during colder weather, then spread out to nearby areas during moderate weather in the spring and fall and retreat into short individual burrows or under shrubs during more the extreme heat of the summer (Woodbury and Hardy, 1940). During the active period, desert tortoises may establish home ranges of approximately 1 square mile. Tortoises feed on a wide variety of herbaceous plants, including cactus, grasses, and annual flowering plants (USFWS, 1994).

Adult desert tortoises reach sexual maturity at 15 to 20 years of age. Mating occurs in the spring (April and May) and the fall (August and September) with nesting and egg laying occurring from May to July (Rostral et al., 1994). The female tortoise lays her eggs in a hole approximately 3 to 4 inches deep that is dug near the mouth of a burrow. Following egg laying, the female covers the eggs with soil (Woodbury and Hardy, 1948). Clutch size ranges from 2 to 14 eggs with an average of 5 to 6 eggs (Luckenbach, 1982). Desert tortoise eggs typically hatch from August through October. These hatchlings are provided a food source in the form of an egg yolk that is assimilated into the underside of the shell. This yolk sac

will sustain the animal for up to 6 months. The hatchling desert tortoise will go into brumation in the late fall, but can be active on warm sunny or rainy days.

Distribution and Occurrence within the Plan Area

The desert tortoise is widely distributed throughout the Mojave, Sonoran, and Colorado deserts. It occupies arid regions from southern Nevada and extreme southwestern Utah to northern Sinaloa, Mexico; southwestern Arizona west to the Mojave Desert and the eastern side of the Salton Basin, California (Stebbins, 1985). In the Mojave region, desert tortoises are primarily associated with flats and bajadas with soils ranging from sand to sandy-gravel, but firm enough for the tortoise to construct burrows (USFWS, 1994). In California, the desert tortoise is most commonly found in association with creosote bush scrub with inter-shrub space for growth of herbaceous plants. However, it may also occur in saltbush scrub, desert wash, desert scrub, and Joshua tree woodlands. The desert tortoise is found from below sea level to elevations of 5,000 feet in California. The most favorable habitats occur at elevations of approximately 1,000 to 3,000 feet.

Along the eastern boundary of the ISDRA, the creosote bush scrub habitat and the desert washes north and south of SR-78 provide marginal suitable habitat for the desert tortoise. Desert tortoises have been observed crossing Vista Mine and Ted Kipf Roads by BLM and Border Patrol officials. To date, surveys for desert tortoise have not been conducted at the ISDRA. Desert tortoise distribution and abundance data does not currently exist. The BLM proposes to conduct surveys to collect such data on this species at a latter date.

Threats

The decline in the desert tortoise population has been attributed to habitat loss, degradation, and fragmentation resulting from increased human population and urbanization in the deserts of the southwestern United States. Collecting of tortoises for pets, livestock overgrazing, landfills, highway mortality, vandalism, agriculture, fire, drought, and OHV use have all contributed to the decline of the tortoise in the wild (Luckenbach, 1982; Federal Register, 1990). Another important factor identified in tortoise declines is the introduction of an upper respiratory tract disease into many of the wild populations (Berry, 1986). This disease may have been introduced through the release of captive desert tortoises into the wild (USFWS, 1994).

3.4.2.3 Flat-tailed Horned Lizard

Status

In California, the flat-tailed horned lizard was designated a sensitive species by the BLM in 1980. In 1988, a petition was submitted to the California Fish and Game Commission (CFGF) to list the species as endangered. In 1989, the commission voted against the proposed listing. In 1993, the USFWS published a proposed rule to list the flat-tailed horned lizard as a threatened species (Federal Register, 1993). No final rule on the proposed listing was issued. In 2001, the USFWS published a notice of reinstatement of the 1993 proposed listing of the flat-tailed horned lizard as a threatened species and reopened the comment period on the proposed rule (Federal Register, 2001). Currently, the State of California and BLM recognizes the flat-tailed horned lizard as a species of special concern and special-status species, respectively.

Life History

The flat-tailed horned lizard has the typical flattened body shape of horned lizards. It is distinguished from other species in its genus by its dark ventral stripe, lack of external openings, broad flat tail, and comparatively long spines on the head (Funk, 1981). The flat-tailed horned lizard has two rows of fringed scales on each side of its body. The species has cryptic coloring, ranging from pale gray to light rust brown dorsally and white or cream ventrally with a prominent umbilical scar. The only apparent external difference between males and females is the presence of enlarged postanal scales in males. Maximum snout-vent length for the species is 3.3 inches (Muth and Fisher, 1992).

Flat-tailed horned lizards escape extreme temperatures by digging shallow burrows in the loose sand. Adults are primarily inactive from mid-November to mid-February. Juvenile seasonal activity is often dependent on temperature fluctuations. Breeding activity takes place in the spring with young hatching in late July and September. The diet of horned lizards typically consists of greater than 95 percent native ant species, mostly large harvester ants (*Pogonomyrmex* spp.).

Distribution and Occurrence within the Plan Area

The flat-tailed horned lizard is found in the low deserts of southwestern Arizona, southeastern California, and adjacent portions of northwestern Sonora and northern Baja. In California, the flat-tailed horned lizard is restricted to desert washes and desert flats in central Riverside, eastern San Diego, and Imperial Counties. The majority of the habitat for the species is in Imperial County (Turner et al., 1980).

The lizard is known to inhabit sand dunes, sheets, and hummocks, as well as gravelly washes. The species is thought to be most abundant in creosote bush scrub habitat. However, this species may also be found in desert scrub, desert wash, succulent shrub, alkali scrub, sparsely vegetated sandy flats, desert pavement, and rocky slopes. They are typically found in dry, hot areas of low elevation (less than 800 feet).

Suitable habitat for the flat-tailed horned lizard is found east of the project area from Ogilby Road and extending south to the All-American Canal (FERC, 2001). Monitoring conducted as part of the North Baja Pipeline Project in 2000 and 2001 detected flat-tailed horned lizard in this area (FERC, 2001). Rado (1995) noted that sand sheets extending east from the sand dunes provide favorable habitat for about a mile northwards from the intersection of Ogilby Road and I-8.

The surveys conducted by the BLM in 1978, 1979, and 1980 reveal that the highest abundance of this species occurs southwest of the ISDRA in the East Mesa Area of Critical Environmental Concern (ACEC). Low abundance of this species was detected on the eastern and western boundaries of the sand dunes, predominantly in the creosote bush scrub habitat. Although this species is known to occur in the central Imperial Sand Dunes, the habitat is considered to be marginal due to the lack of suitable soil structure required to support their predominant prey: harvester ants (BLM, 2001b). Figure 3-6 depicts the distribution and abundance of the flat-tailed horned lizard at the ISDRA.

Threats

Human activities have resulted in the conversion of approximately 34 percent of the historic habitat of the flat-tailed horned lizard. The decline in the flat-tailed horned lizard population

is primarily due to impacts from utility lines, roads, geothermal development, sand and gravel mining, OHV use, waste disposal sites, military activities, pesticide use, and Border Patrol activities (Foreman, 1997). Harvester ants, the primary prey of the horned lizards, are particularly sensitive and easily displaced by Argentine ants (UCSC, 2001). Currently, the Argentine ants (*Linepithema humile*), an invasive species, are moving up the California coastline with drastic effects on native ant species (Gordon, 1997). California harvester ants suffer undue losses, and plants that depend on them for seed dispersal may also suffer. Horned lizard abundance is strongly correlated to the absence of Argentine ants and subsequent presence of native ant species, indicating that the Argentine ants are indirectly affecting the horned lizard population (UCSC, 2001).

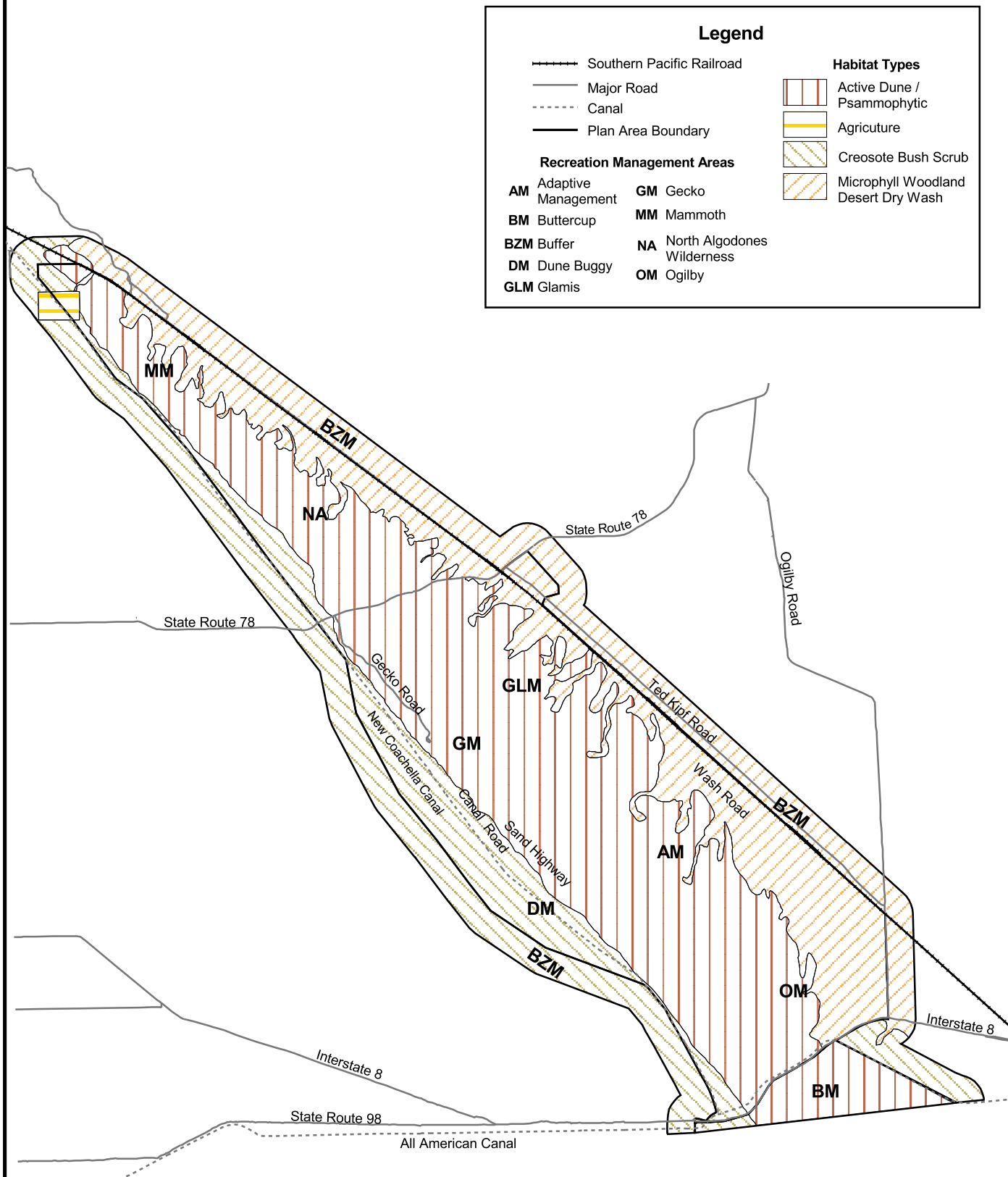


Figure 3-1
Habitat Types
 Imperial Sand Dunes Recreation Area - Biological Assessment



0 2 4 6 Miles

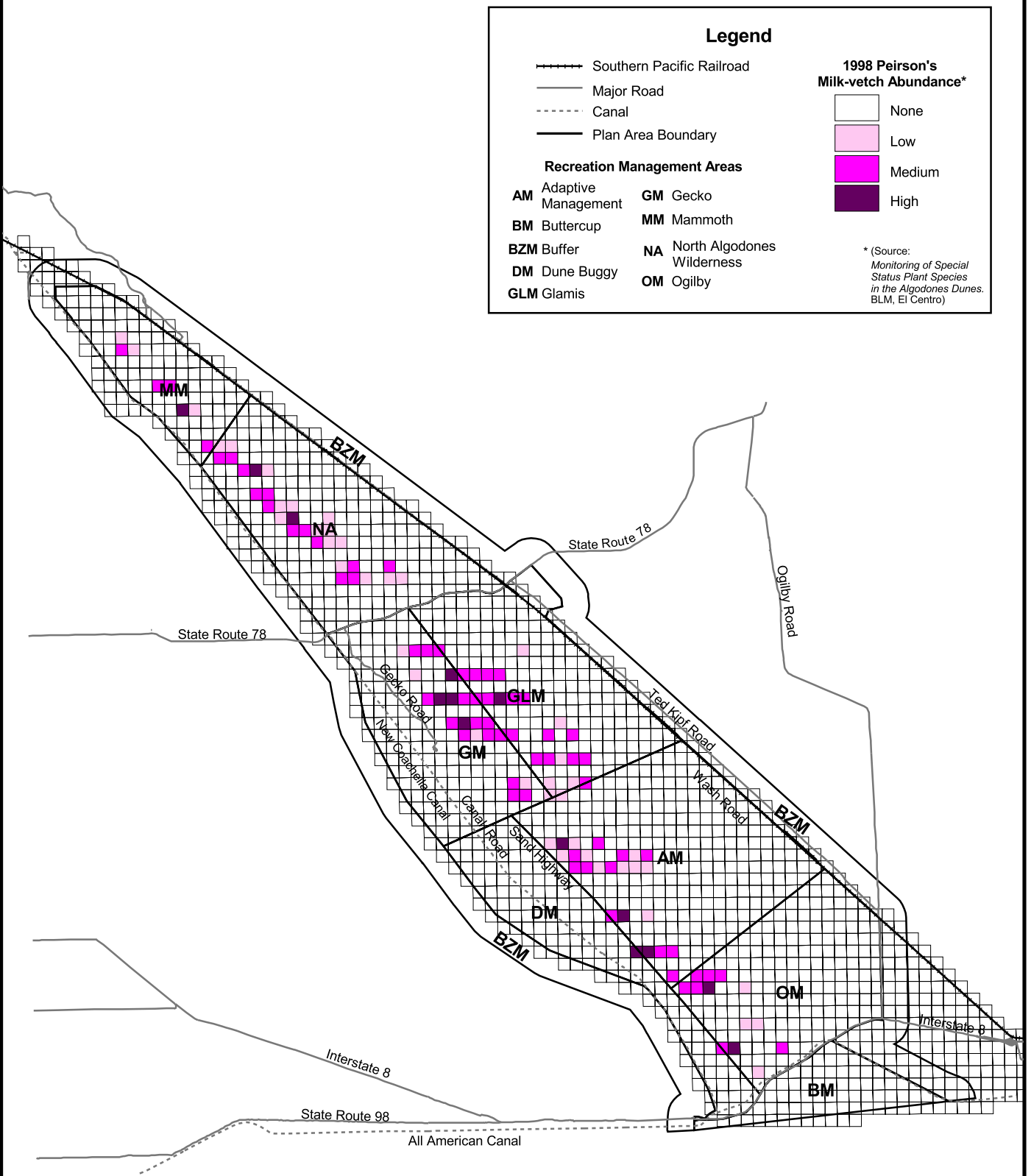


Figure 3-2
 Peirson's Milk-vetch 1998 Distribution
 Imperial Sand Dunes Recreation Area - Biological Assessment

0 2 4 6 Miles



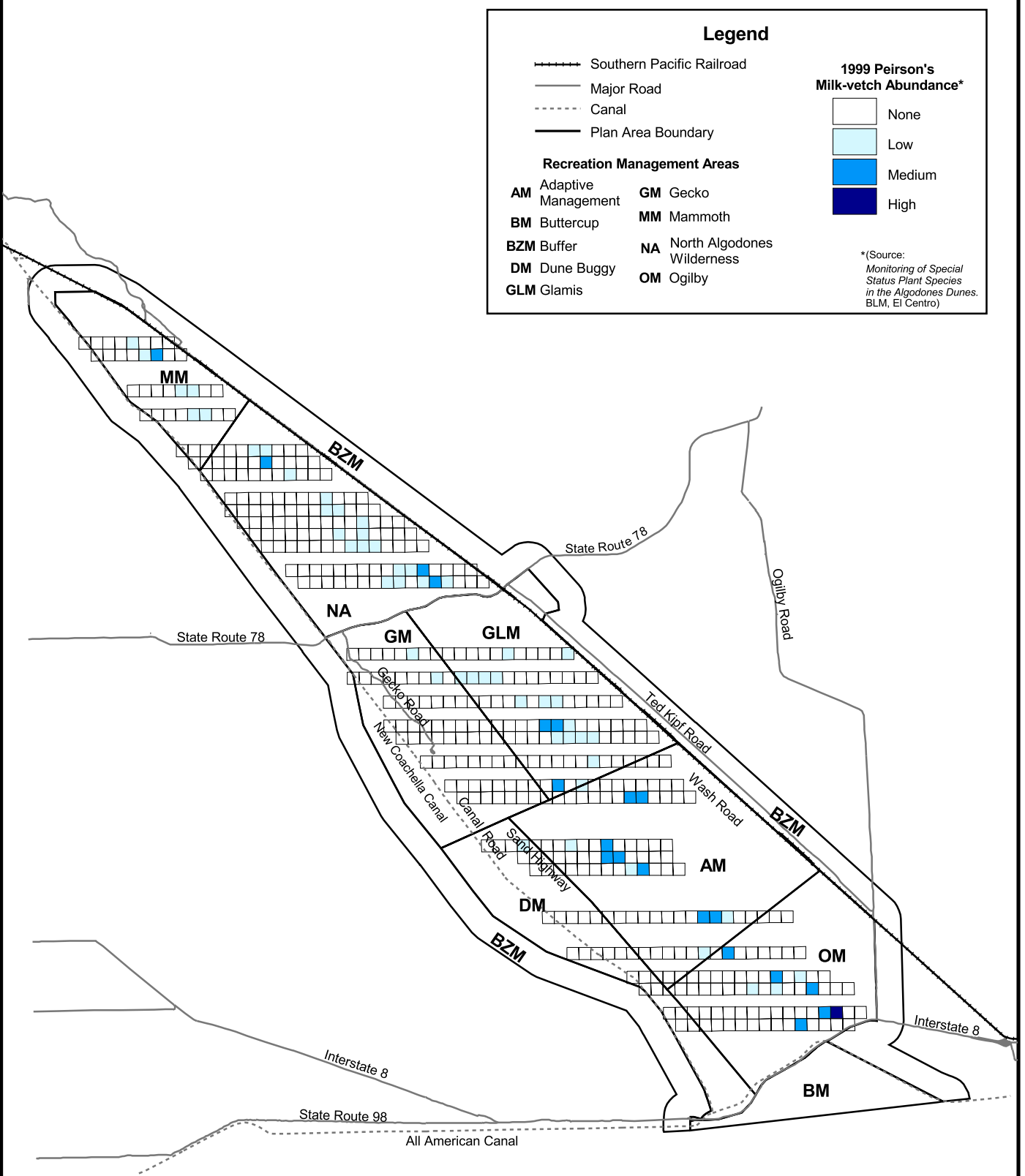


Figure 3-3
 Peirson's Milk-vetch 1999 Distribution
 Imperial Sand Dunes Recreation Area - Biological Assessment



0 2 4 6 Miles

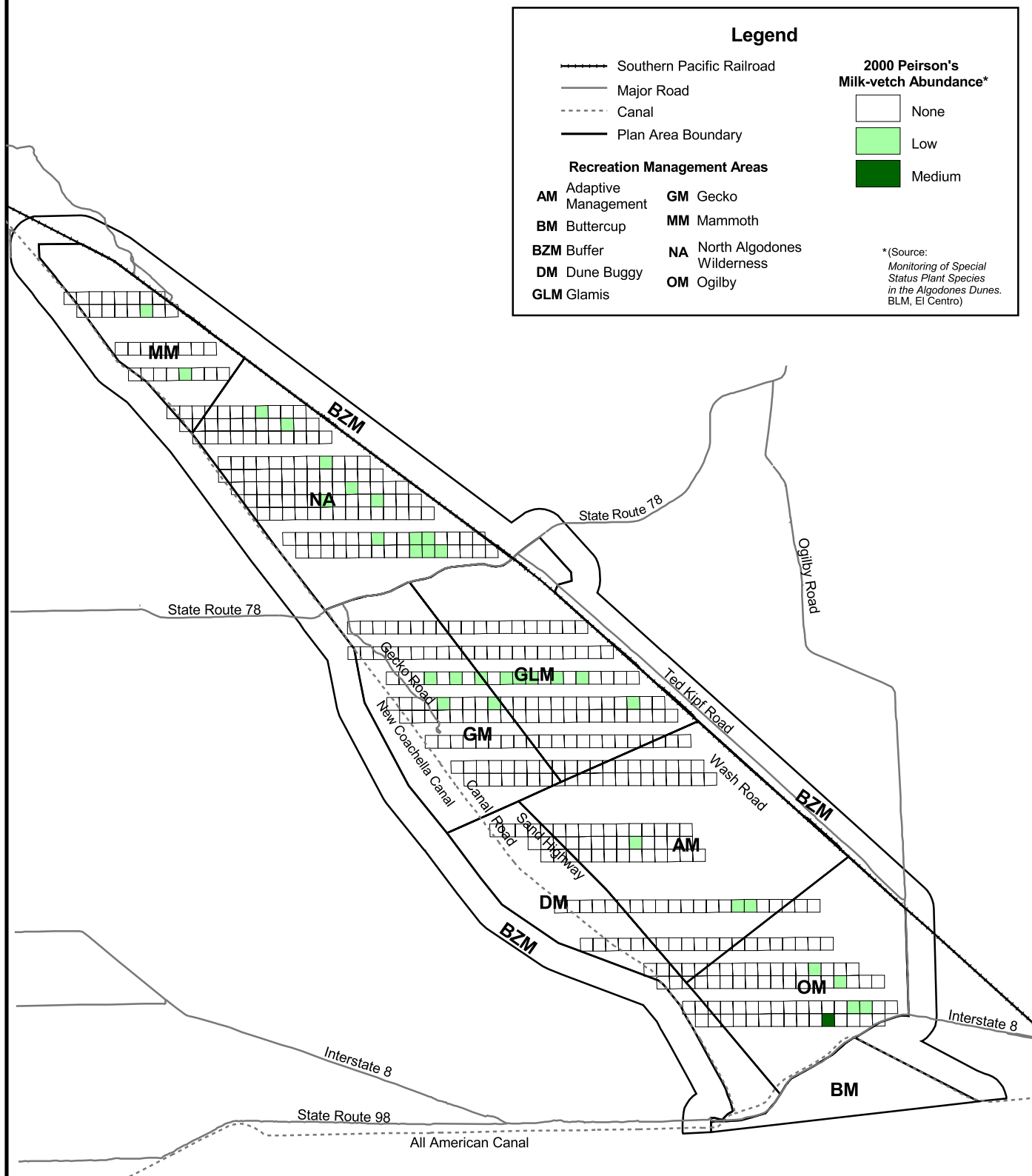
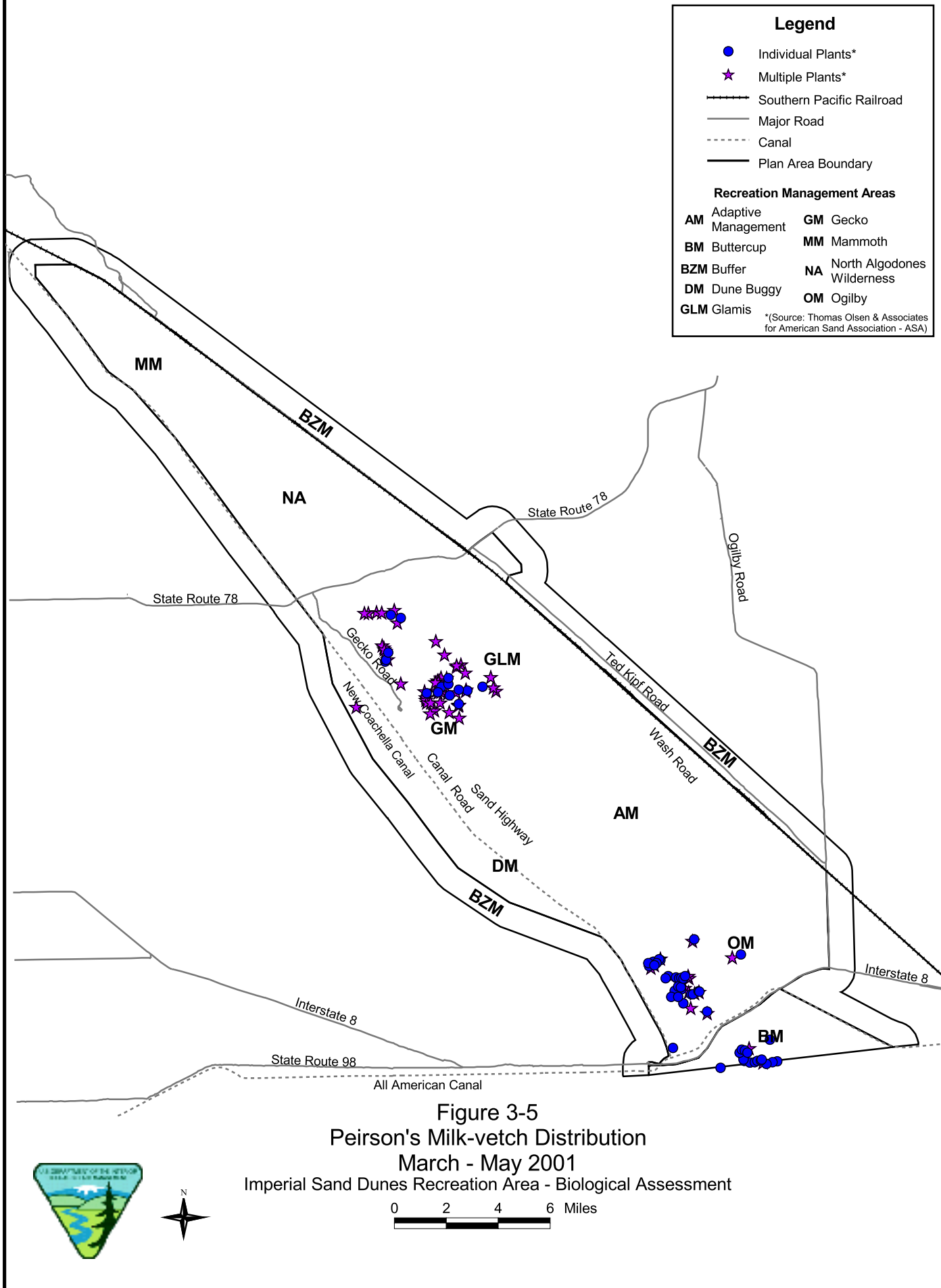


Figure 3-4
Peirson's Milk-vetch 2000 Distribution
 Imperial Sand Dunes Recreation Area - Biological Assessment



0 2 4 6 Miles



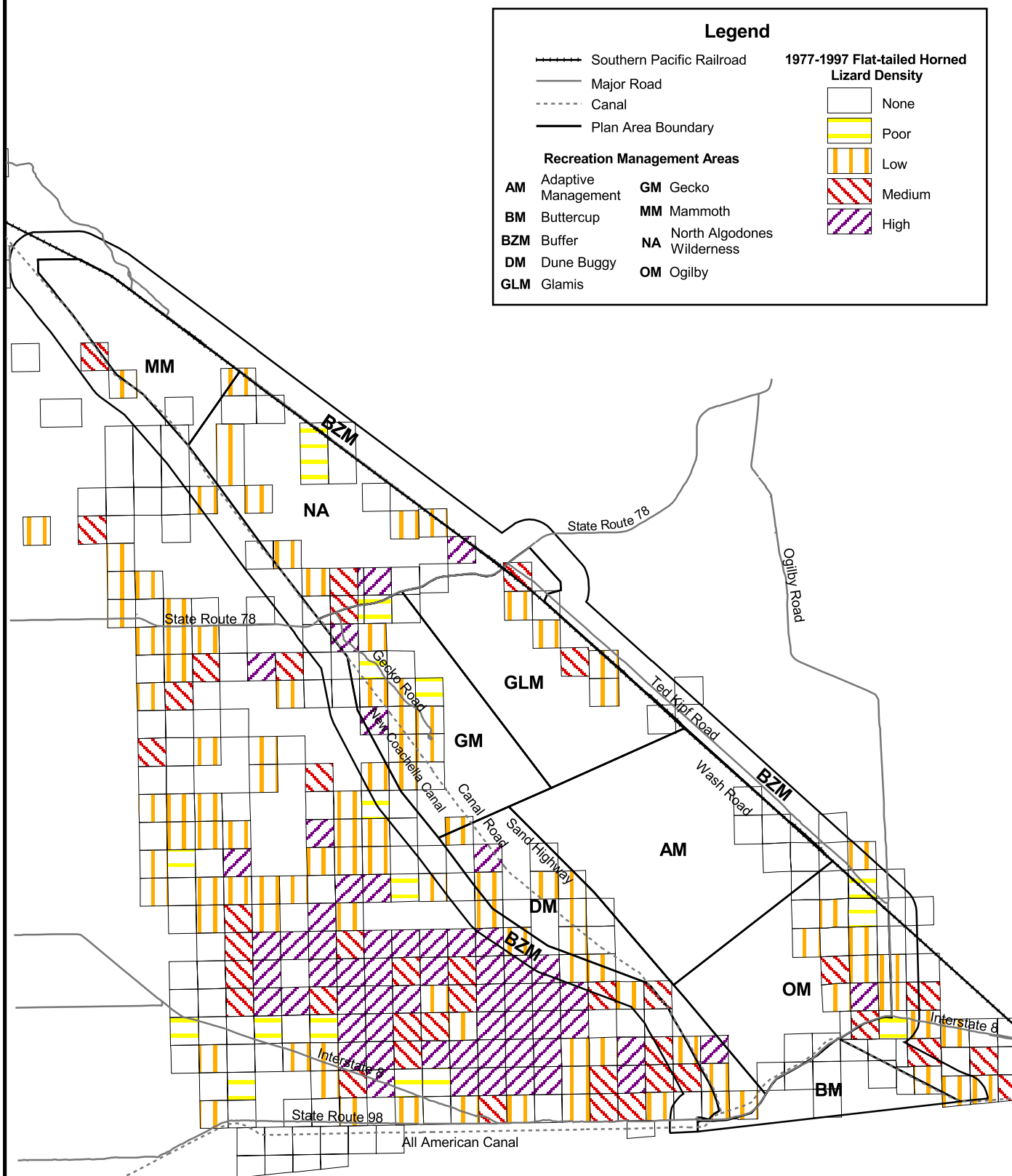


Figure 3-6
Flat-tailed Horned Lizard Distribution (1977-1997)
 Imperial Sand Dunes Recreation Area - Biological Assessment



0 2 4 6 Miles

4.0 Impacts and Mitigation

The following is an assessment of the potential impacts, both beneficial and adverse, of actions set forth in the RAMP on the Peirson's milk-vetch, desert tortoise, and flat-tailed horned lizard relative to the No Action Alternative presented in Section 2.1. Impacts are assessed by Management Area and their respective ROS classification (Figure 2-1) along with data on recreation impacts (Figures 4-1, 4-2, 4-3, and 4-4). As appropriate, specific mitigation measures to reduce potential impacts are presented.

4.1 Peirson's Milk-vetch

4.1.1 Impacts

Intensive use of any habitat, whether it be from development or recreational use, is likely to result in negative impacts to habitat and associated biota. The most extensive monitoring studies on the Peirson's milk-vetch at the ISDRA have been conducted by the BLM (2001). These studies concluded that responses of this species were similar in both the areas closed and open to OHV use during the monitoring effort (1998, 1999, and 2000). These multiyear studies concluded that plant responses were closely tied to precipitation. The TOA (2001) study discussed in Section 3.4.2.1 concluded that OHV use affected less than 1 percent of the plants and, therefore, did not appear to be a threat to the health of the Imperial Sand Dunes population of Peirson's milk-vetch. It should be noted, however, that all studies have inherent limitations that preclude a complete understanding and determination of the "cause and effect." What is evident, however, is that there are other abiotic factors that may have a greater influence on the surface expressions of Peirson's milk-vetch and its propagation in the Imperial Sand Dunes. These factors include the phenological characteristics, such as available seed bank, seed germination success, and precipitation. In addition, recreational use has been an integral part of the Imperial Sand Dunes for over 20 years; and, even with this intensive use, this hardy species is observed scattered across the dunes. This may be an attestation to the hardiness of this species. However, in light of the fact that this is a dune-endemic species, incremental increase in intensive recreational use could result in adverse impacts, at least in some locations, to this species at the Imperial Sand Dunes. Therefore, the potential impacts to populations as a whole at the Imperial Sand Dunes need to be evaluated in terms of adaptively managing the level of recreational use. An ongoing assessment of impacts of recreational use of the ISDRA is an integral part of the RAMP, particularly the Monitoring Plan (Appendix 1 of the RAMP).

4.1.1.1 Plan Area Management Actions

As previously noted, with the exception of the buffer zone, some Peirson's milk-vetch is located in each of the management areas and would therefore benefit from ISDRA management actions focused on conservation of biological resources for the entire Plan Area. Plan Area management conservation actions that would benefit the Peirson's milk-vetch are summarized below:

Education Programs

- The BLM would provide environmental awareness training for all OHV users. The training would identify sensitive biological resources at the Plan Area and address conservation measures to minimize OHV impacts.
- An educational outreach program would be developed to educate OHV users about the biological resources of the Plan Area. The program would focus on Peirson's milk-vetch as well as other special-status species and provide simple effective ways of avoiding or minimizing impacts. Geographic information system (GIS) maps or informational pamphlets about the species and sensitive areas to be avoided also would be a part of the outreach effort.
- In addition to educating to the public visiting the dunes, the BLM staff would provide education beyond the Plan Area to local public schools in Imperial County.
- Interpretive centers/kiosks would be placed in strategic locations near the Ranger Station and campgrounds to educate OHV users about natural resources within the Plan Area. Brochures, informational leaflets, and maps would be available at the interpretive centers.
- To encourage the control of pets, information on the negative impacts of predation on wildlife would be made available to all visitors at the interpretive kiosks.
- Bulletin boards would be installed within the campgrounds. Rules, regulations, and maps would be posted. The maps would identify popular recreation sites, routes, campgrounds, and vendor sites. Speed limits, quiet hours, use of fire pans, etc., would be outlined in the rules.

Controlled OHV Use

Entry into the Adaptive Management Area would be controlled through use of permits.

No-Camping Buffer Zone

A 1-mile-wide, no-camping buffer zone would be established around the entire Plan Area. Only designated camping would be allowed within this 1-mile buffer. Appropriate signage placed at strategic locations would indicate where designated camping is allowed. Law enforcement officers would be responsible for ensuring compliance and would cite violators. This action should reduce travel into Peirson's milk-vetch habitat.

Signage to Ensure Compliance with Closed Areas

Carsonite signs would be used to delineate closed and limited access areas. To ensure that camping activity remains within designated camping areas and routes, each camping pad would be identified with a posted number. These numbered camping sites and access routes would be designated on a map, which would be available to all visitors. Camping and vehicular activity within these areas would be frequently monitored.

GIS Data Collection and Repository

A centralized GIS data repository would be established for collection and analysis of GIS data pertaining to the entire dunes. The repository would be housed at the BLM El Centro Field Office. The focus of the data collection and analysis would be the Peirson's milk-vetch; however, additional data may be collected to analyze population trends of other special-

status species within the Plan Area. The GIS data would support implementing adaptive management strategies for conserving special-status species.

Preconstruction Siting and Clearance Survey Requirements

Prior to construction activities, a site suitability analysis would be conducted to locate areas with the least potential impact to biological resources.

Control of Invasive Plants

BLM would inventory the distribution and abundance of invasive plant species as part of the annual special-status species monitoring program. Preventive measures would include minimization of soil disturbance; closure of unnecessary routes, where possible; limiting the use of construction materials such as gravel, fill, mulch straw, and seed mixes that may carry seeds of invasive plants. Postconstruction monitoring would ensure there is no invasive plant propagation.

4.1.1.2 Mammoth Management Area

The RAMP identifies this area as ROS Semi-Primitive Motorized reflecting its current recreational use. There are no anticipated changes in OHV-use patterns anticipated in the Mammoth Management Area through implementation of the RAMP. Increases in impacts to Peirson's milk-vetch could result from increased visitor use.

4.1.1.3 North Algodones Dunes Wilderness Management Area

This area provides 27,087 acres of nearly complete protection for the Peirson's milk-vetch and other biological resources. Increased protection from improved law enforcement and visitor education should further reduce potential impacts to this species from motorized recreation or illegal entry.

4.1.1.4 Gecko Management Area

This is currently the most developed management area in the ISDRA and will be managed under the ROS Rural classification. Facilities for intensified motorized use and camping already exist. Areas marked for proposed improvement would have not direct impacts on Peirson's milk-vetch in that these area do not currently support the species. Any indirect effects from increased visitor use would be partly offset from proposed increased visitor education resulting from installing kiosks and interpretive areas at Osborne Overlook and near public phones at Gecko Road, Gecko Campground, and Roadrunner Campground.

4.1.1.5 Glamis Management Area

As is the case with the Gecko Management Area, the Glamis area will be managed as ROS Roaded Natural reflecting its historical use. Proposed facilities improvements are not likely to directly impact the Peirson's milk-vetch. Increases in impacts to Peirson's milk-vetch could result from increased visitor use.

4.1.1.6 Adaptive Management Area

The Adaptive Management Area encompasses 33,289 acres of the most diverse habitat in the ISDRA along with some of the most suitable habitat and highest abundance of Peirson's milk-vetch (Figure 4-3). This management area will be managed using principles of adaptive management. Adaptive management is a process of implementing policy decisions as

scientifically driven management experiments that test predictions and assumptions in management plans, using the resulting information to improve the plans. It is a mechanism for integrating scientific knowledge and experience for the purpose of understanding and managing natural systems such as the ISDRA ecosystem.

This process allows for the continuous improvement of management policies and practices based on previous outcomes of operational programs. Its most effective form, “active” adaptive management, employs management programs that are designed to experimentally compare selected policies or practices, by evaluating alternative hypotheses about the system being managed (Nyberg, 1998). Adaptive management is a way for managers to proceed responsibly in the face of multiple uncertainties. A simple, effective, six-step process for the ISDRA adaptive management program has been used in developing management actions in the RAMP.

- **Problem assessment:** This involves defining the scope of the management problem as developed through evaluation of issues, concerns, opportunities, desired future conditions, and identification of additional data needs.
- **Design:** This involves the design of management actions to further understand and quantify impacts, thresholds, visitor supply, and levels of acceptable change. This step involves designing a management plan / monitoring program that will provide reliable feedback about the effectiveness of planned actions to meet management objectives. This step should yield information to fill the gaps in understanding (e.g., effects of OHV use on Peirson’s milk-vetch) identified during problem assessment.
- **Implementation:** Management actions are implemented to generate knowledge for continuing analysis and evaluation.
- **Monitoring:** In this step, key response indicators are monitored to determine the effectiveness of the management actions.
- **Evaluation:** This involves an analysis of the management outcome, in light of original management objectives.
- **Adjustment:** This is a reassessment of the challenges and an adjustment of management objectives and planned actions, in light of new data developed.

Habitat conservation will be achieved through the classification of a limited access interior dune adaptive management area, characterized by contiguous east-west sensitive-species habitat. The adaptive use area would be accessed via permit. Visitor supply ranges would be established to provide a high quality day-use Semi-Primitive Motorized recreation opportunity for all-terrain vehicle (ATV) and dune buggy enthusiasts, with special chances for small groups of family and friends to enjoy a sense of remoteness and tranquility, the sights and sounds of nature, to learn about sand dune ecology, to explore, to practice good stewardship, and feel inspired by the awe of the ISDRA. This area provides nature-based opportunities where the focus is on experiencing the natural resource and not the power, speed, or other attributes of the motorized conveyance. Periodic modification to the visitor supply range would be determined through professional analysis resulting from data and information compiled during ongoing resource and visitor satisfaction surveys and monitoring programs.

The management objective in the Adaptive Management Area is to provide for high quality, unique world class day-use Semi-Primitive Motorized Recreation Opportunity for ATV, motorcycle, truck and dune buggy activities. The recreation visitor supply for the Adaptive Management Area will be 75 groups (up to 525 vehicles) per day during the visitation season.

Access to the Adaptive Management Area will be by permit only, except for administrative and law enforcement purposes. To obtain a permit, the driver of each vehicle must pass a resource conservation exam. When requesting a permit, each vehicle and driver must be identified. One permit would be valid for one group of up to 7 vehicles for a period of up to 7 days. A day-use period is defined as a period from sunrise to sunset. Reservations and/or multiple reservations could be made in advance. During the first year, all permits will be issued onsite to determine visitor supply needed in the Adaptive Management Area. During subsequent years, a maximum of 70 percent of all permits would be issued by reservation; and 30 percent would be issued in person at the Cahuilla Ranger Station. Should reservations not meet the 70 percent maximum, the balance of permits will be made available at the Cahuilla Ranger Station. Reservations may be made for 1 to 7 days based on availability. Permittees making reservations would receive all materials, including a permit, through the mail. A permit would not be authorized until all signatures and fees have been completed. Each permit issued would include printed environmental education material and a test on sensitive plant and animal species, other sensitive resources, safety materials, and general stipulations for use of the area. A permit holder must sign that he/she has read and understands the printed material and stipulations. A fee would be charged for each permit issued. The fee would be based on cost recovery for the administration of this permit and adaptive area. Cost recovery would be based on, but not limited to, the cost of printing environmental education material related to sensitive species within the Adaptive Management Area, compliance, signing, and monitoring. A business plan would be prepared to determine cost recovery. Each vehicle within a group that is issued a permit would be provided a safety flag that is easily identifiable by BLM from the ground and/or air. Vehicles within the Adaptive Management Area without a permit and BLM-issued safety flag would be issued a citation for being in the area without authorization. Permitted access to the Adaptive Management Area would be allowed through the boundary, except through the microphyll woodlands on the east side of the management area.

To measure the success of the Adaptive Management Area, BLM will establish a biological monitoring program in accordance with Appendix 1 of the RAMP. BLM will establish a visitor satisfaction and demand survey to determine if visitor satisfaction and demand are being met within the boundary area. No facilities will be allowed in the Adaptive Management Area. Interpretive and informational signs may be allowed in conformance with the objectives of the Adaptive Management Area. No commercial services and/or competitive events will be allowed in the Adaptive Management Area.

4.1.1.7 Olgilby Management Area

The absence of newly proposed road improvements or recreational facilities in this management area represents a direct and indirect benefit to Peirson's milk-vetch. The aggressive outreach programs for habitat conservation and resource protection is a further benefit. The low-to-intense concentration of OHV recreation in this area for families and

groups will likely result in some continued impacts to the species (Figure 4-2); however, managing the area as Road Natural does not represent a potential increase in impacts.

4.1.1.8 Dune Buggy Flats Management Area

This management area is currently used for camping, OHVs, commercial vending, and rights-of-way. It would be managed under the Road Natural classification of the ROS spectrum reflecting its current use. Improvements such as applying and maintaining dust palliative on the wash road, grading entrance roads, and constructing pit toilets are unlikely to directly impact Peirson's milk-vetch.

4.1.1.9 Buttercup Management Area

This management area would be managed under the Rural classification under the ROS reflecting its current use for camping, OHV use, sightseeing, commercial vending, education, filming, and rights-of-way. Proposed facilities improvements would be unlikely to directly impact Peirson's milk-vetch population in the area.

4.1.1.10 Buffer Zone Management Area

The creosote bush scrub of the Buffer Zone does not provide habitat for the Peirson's milk-vetch. However, precluding camping in this area should reduce potential impacts from recreational use on nearby populations.

4.1.1.11 Overall Impacts

Implementation of the RAMP would have, on balance, beneficial impacts on the Peirson's milk-vetch in the Plan Area relative to Alternative 1. The combined area of the Adaptive Management Area and North Algodones Dunes Wilderness Area afford a high level of protection for the Peirson's milk-vetch. Implementation of the RAMP will enable BLM staff to better conserve and manage the dunes as a conservation area for this species. Also, the majority of the potential direct impacts authorized under various actions would occur in areas not known to support this species (Figure 4-2).

4.1.2 Mitigation

Aside from the conservation efforts that are an integral part of the objectives of the RAMP, standard mitigation measure would be implemented to reduce impacts from construction activities. Prior to implementing any construction activities, a site suitability analysis will be conducted to determine areas with the fewest constraints for siting. These areas may be areas with no to low occurrence of Peirson's milk-vetch and other sensitive species, or areas already supporting high-use activity. The analysis may be supported by conducting a topological overlaying of various GIS data coverages.

The GIS siting analysis will be followed by a presurvey to ground truth the potential siting area. This action will be performed to determine actual occurrence and abundance of Peirson's milk-vetch and other special-status species in this area.

Based on the initial siting analysis, impact avoidance measures may be taken, which may include minimization of project footprint or relocation of the facility in the event of potential impacts to sensitive plants. Presurveys will be performed by qualified biologists and in accordance with accepted protocols and guidelines.

4.2 Desert Tortoise

4.2.1 Impacts

Desert tortoise are located on the eastern periphery of the Plan Area. The majority of the Plan Area does not support suitable habitat for the desert tortoise. Although tortoises have been observed in the eastern portion of the Plan Area in the microphyll woodland/creosote bush scrub/open desert wash habitats, abundance of tortoise is likely to be very low. However, tortoises would be adversely affected as a result of the OHV activities authorized by the RAMP. Desert tortoise will directly benefit from management actions in the Buffer Zone, particularly the prohibition on camping and increased public awareness of tortoise conservation.

Any localized impacts would be further minimized by proposed mitigation. No activities are planned within the desert tortoise critical habitat; therefore, the proposed actions will not directly affect primary elements of the critical habitat. Potential indirect impacts to desert tortoise or critical habitat will be minimized through restricted access routes through the microphyll woodland/open desert wash areas.

4.2.2 Mitigation

Standard mitigation measures for potential impacts to the desert tortoise and its habitat from construction activities are presented below. Although the focus of this conservation strategy is desert tortoise, these same measures are applicable for conservation of other desert reptile species such as flat-tailed horned lizard and fringe-toed lizard.

4.2.2.1 Preconstruction Surveys

Preconstruction surveys would be conducted prior to any ground disturbing activities in suitable desert tortoise habitat to verify no desert tortoise or burrows or both would be impacted. Surveys would be conducted similar to the USFWS protocols and would be conducted by a qualified biologist (USFWS, 1992). A qualified biologist is a professional biologist who has knowledge about the biology and ecology of the desert tortoise and has demonstrated experience with the desert tortoise. This includes experience in techniques to locate and handle tortoises and inventory of desert tortoise habitat. Desert tortoise handling will follow the guidelines provided in *Guidelines for Handling Desert Tortoises During Construction Projects* (Desert Tortoise Council, 1994). Preconstruction surveys would be conducted within 24 hours of initiation of construction activity, to clear the construction area of tortoises or burrows. If a tortoise or tortoise sign is found during the preconstruction surveys, the USFWS, CDFG, and BLM would be notified within 24 hours.

4.2.2.2 Mitigation Measures During Construction Phase

Prior to onset of construction, the construction area would be clearly marked or flagged along the project boundaries. Construction crews would be instructed to confine activities to flagged or marked areas. No paint or permanent discoloring agents would be applied to rocks or vegetation to indicate survey or construction activity limits.

A qualified biologist will conduct a full-coverage presurvey and zone of influence transects for the construction footprint. The presurvey would be performed within 24 hours of the onset of construction activities.

Those tortoise burrows located within the Plan Area that cannot be avoided would be excavated by hand during this phase. All excavations of burrows would be in accordance with desert tortoise handling procedures specified by the USFWS and under authorization of CDFG and USFWS. Measures would also be taken to prevent tortoises from reoccupying the burrow sites affected by construction. Burrows would be excavated, and any handling of tortoises would be accomplished by authorized biologists.

All tortoises found within the construction area, whether aboveground, in excavated burrows, or found in open trenches, would be placed 300 to 1,000 feet outside the immediate construction footprint. Tortoises would be relocated by the authorized biologist in compliance with the Desert Tortoise Guidelines produced by the Desert Tortoise Council (1990) Appendix 7.

Open trenches would be constructed with suitable egress at either end to allow wildlife to escape. Open trenches within potential tortoise habitat would be inspected periodically throughout the day. Trenches would be inspected immediately prior to backfilling by a qualified biologist.

All construction-vehicle movement outside the construction areas would be restricted to predesignated access or public roads. Overnight parking and storage of equipment and material would be in previously disturbed areas (i.e., lacking vegetation). These areas would also be designated by the preconstruction survey team.

Construction workers would strictly limit their activities and vehicles to construction areas and routes of travel that have been flagged to eliminate adverse impacts to desert tortoises and their habitat. Aside from these areas, workers may not drive cross-country even within the right-of-way. All workers would be instructed that their activities are restricted to flagged and cleared areas.

Hazardous materials would not be drained onto the ground or into streams or drainage areas. Totally enclosed containment would be provided for all trash. All construction waste including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials would be removed to a disposal facility authorized to accept such materials. Totally enclosed, raven-proof containment would be provided for all trash.

To prevent mortality, injury, and harassment of desert tortoises and damage to their burrow, pets would be confined or leashed.

No widening or upgrading of existing access roads would be undertaken in the area of construction, except for repairs necessary to make roads passable. There would be no blading of new access roads.

4.3 Flat-tailed Horned Lizard

4.3.1 Impacts

The majority of use by OHV use is well removed from areas known to support a high abundance of these species (Figure 4-4). However, flat-tailed horned lizards would be adversely affected by the motorized OHV activities authorized by the RAMP. The Plan Area contains approximately 113 cells occupied by flat-tailed horned lizards. The North Algodones Dunes Wilderness Area would provide full protection for 17 occupied cells (15 percent of the total) within the Plan area. The Adaptive Management Area would provide limited protection for 28 occupied cells (25 percent of the total) containing flat-tailed horned lizard. Areas with no specific protection encompass 67 occupied cells (60 percent of the total) within the Plan Area.

The Buffer Zone Management Area management actions established in the RAMP will be effective in reducing impacts to this species, particularly the no camping zone. The monitoring will at least answer questions concerning whether psammophytic scrub supports many flat-tailed horned lizards and, if so, clarify the distribution of flat-tailed horned lizard in the Plan Area (described in detail in Appendix 1 of the RAMP). Any localized direct impacts will be further minimized by preconstruction siting analysis, preconstruction surveys, and construction-phase monitoring identified for desert tortoise in this Biological Assessment as well as in *The Flat-tailed Horned Lizard Rangewide Management Strategy* (Foreman, 1997).

4.3.2 Mitigation

The flat-tailed horned lizard is also afforded protection through *The Flat-tailed Horned Lizard Rangewide Management Strategy* (Foreman, 1997). This document was prepared to provide guidance for the conservation and management of sufficient habitat to maintain viable populations of this species. The management strategy was prepared by representatives from federal, state, and local governments and designed to be used as the basis for a conservation agreement among the agencies. Surface disturbing activities are limited in the management areas identified in the strategy. Land alterations outside of these management areas are not be restricted, but special mitigation and compensation measures would be applied. These measures are applicable to the Plan Area.

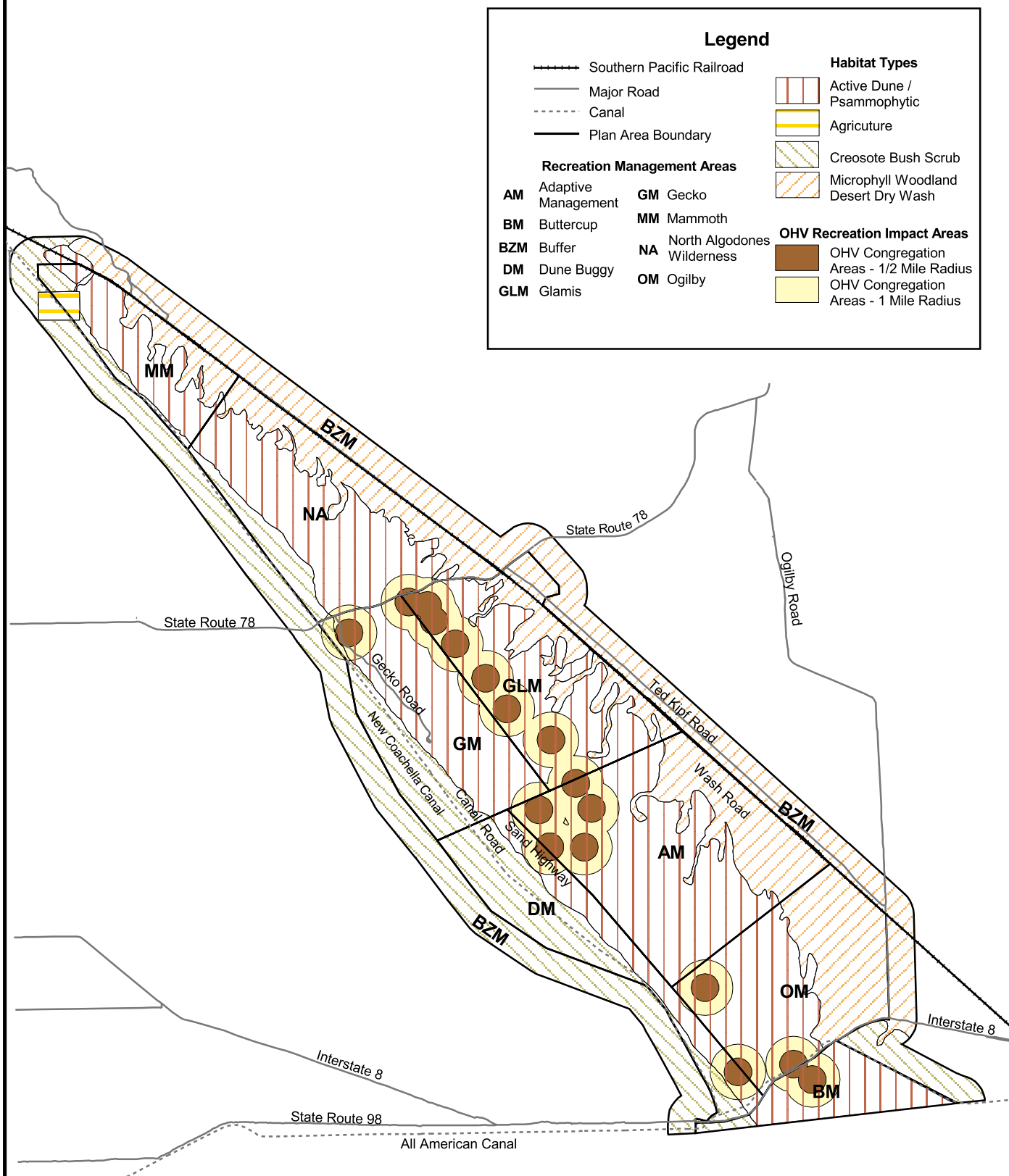


Figure 4-1
 Recreation Impact Areas and Habitat Types
 Imperial Sand Dunes Recreation Area - Biological Assessment



0 2 4 6 Miles

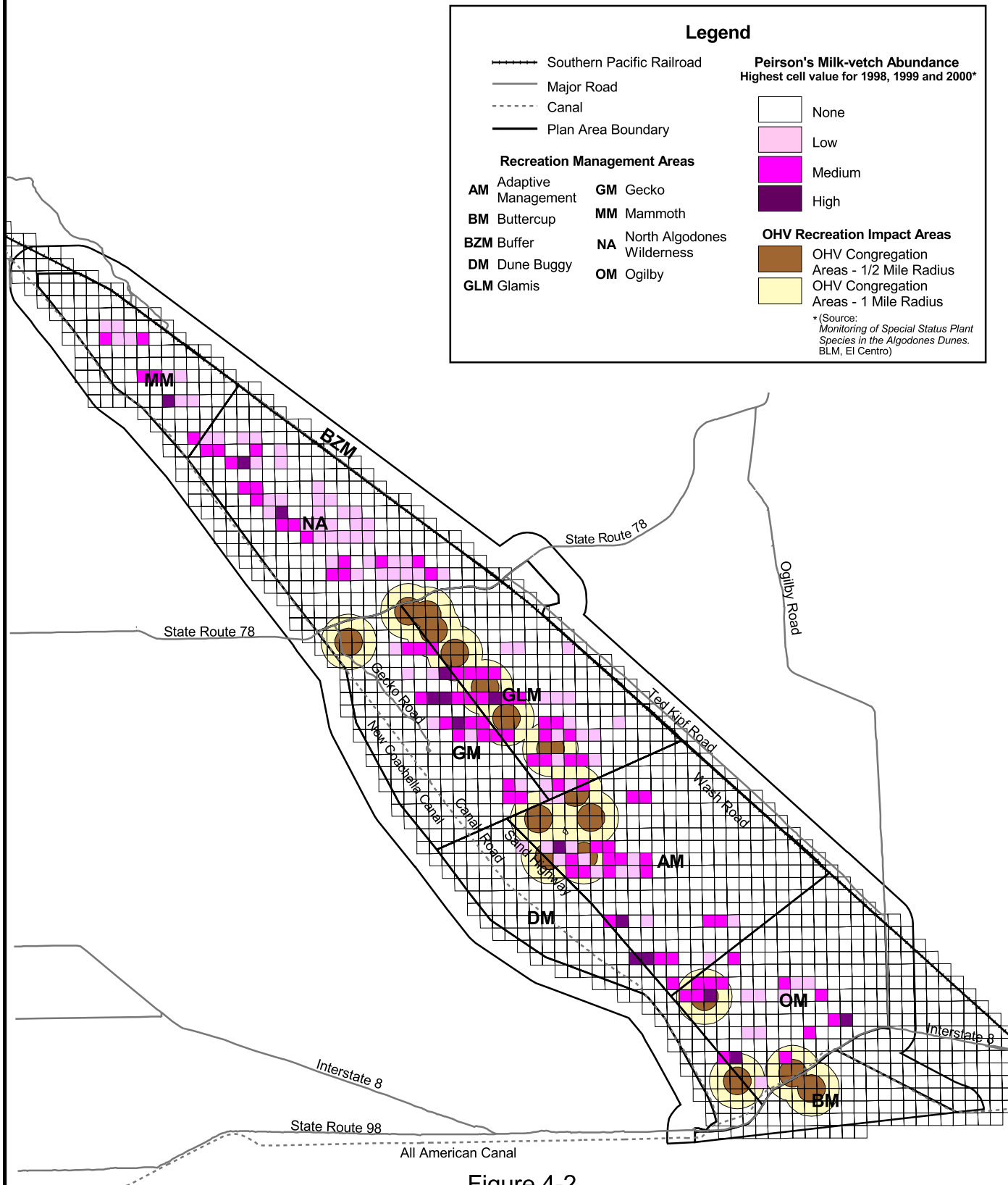


Figure 4-2
Recreation Impact Areas and
Peirson's Milk-vetch Distribution
 Imperial Sand Dunes Recreation Area - Biological Assessment



0 2 4 6 Miles



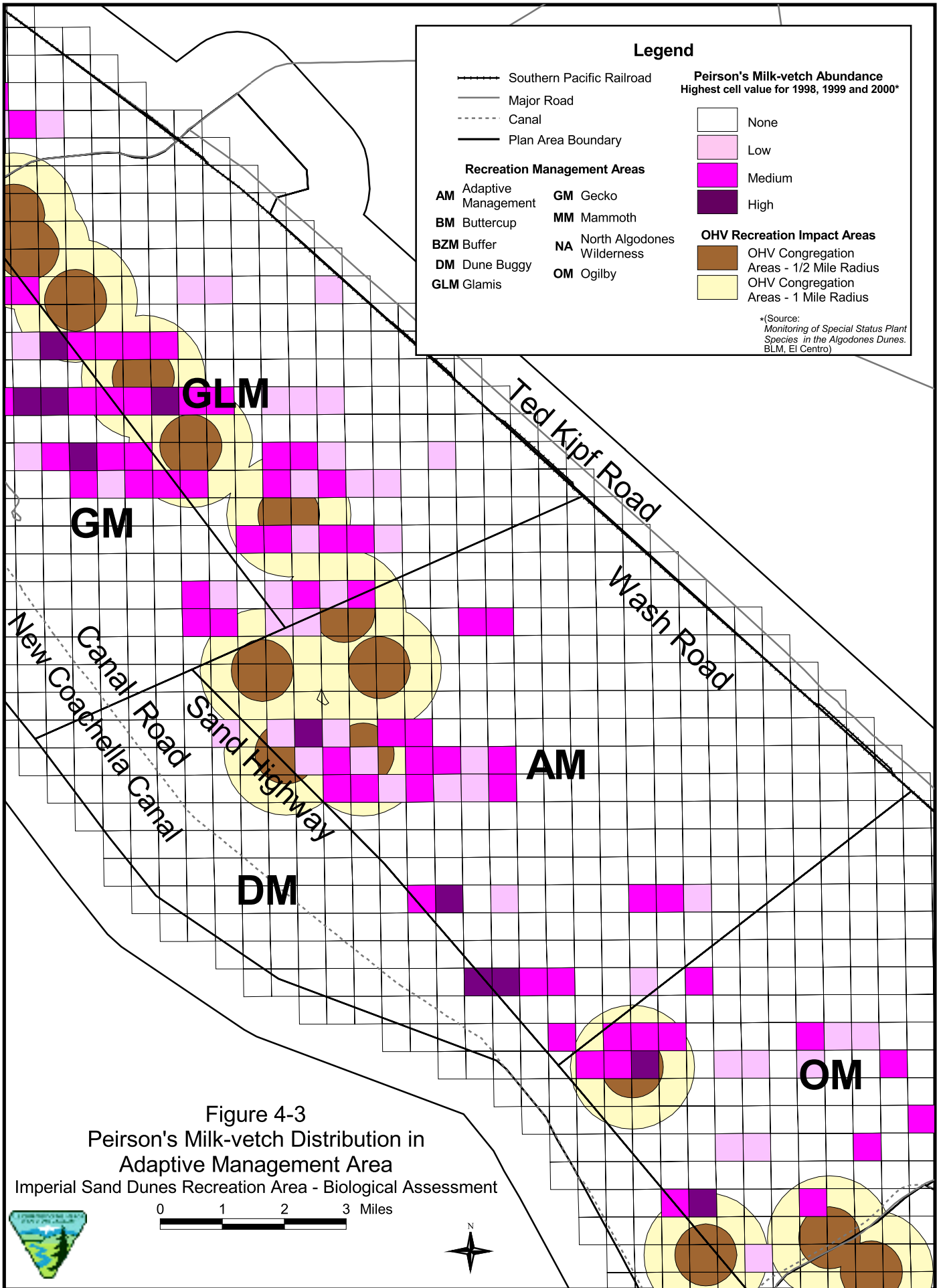


Figure 4-3
Peirson's Milk-vetch Distribution in
Adaptive Management Area
Imperial Sand Dunes Recreation Area - Biological Assessment



0 1 2 3 Miles



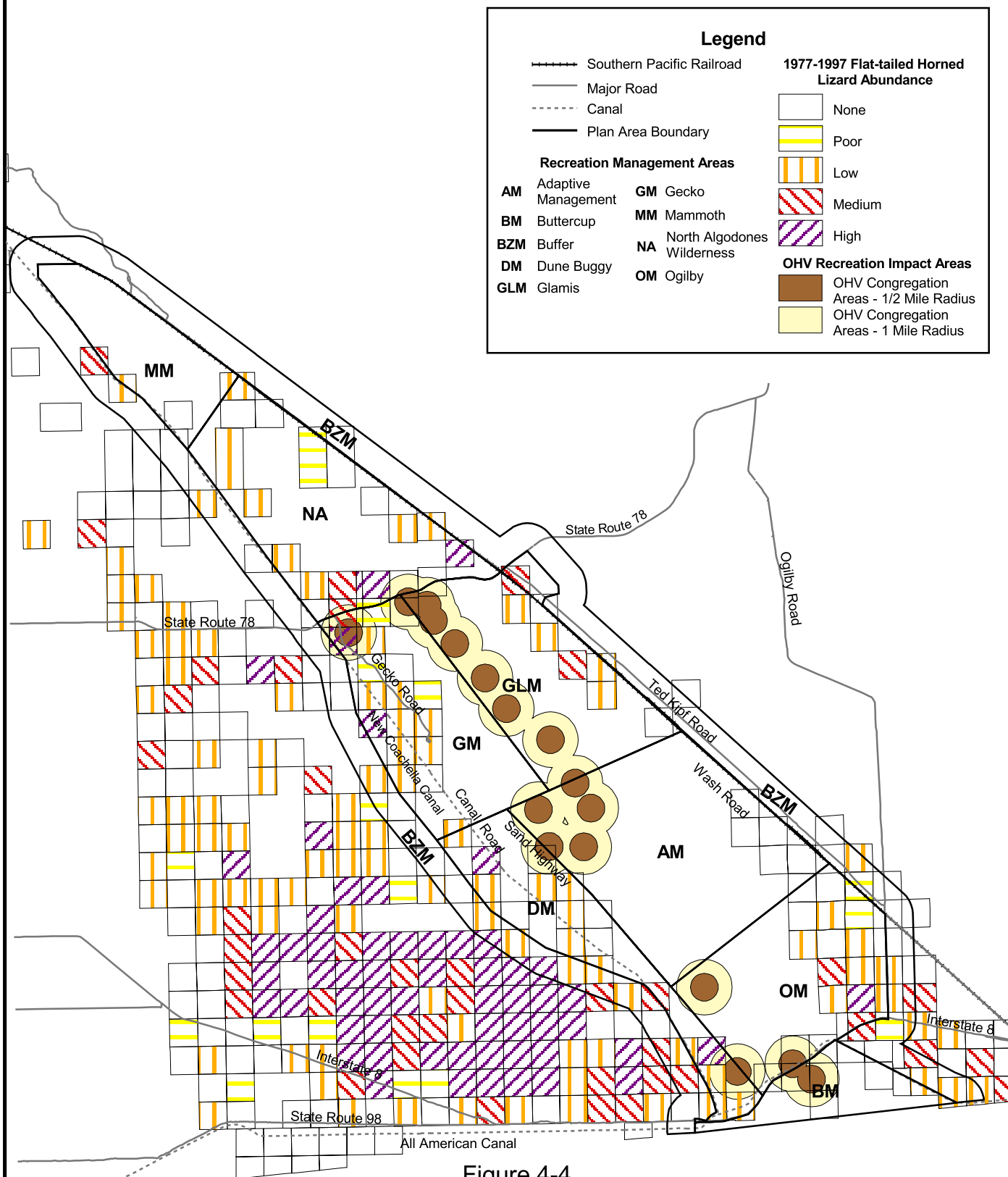


Figure 4-4
 Recreation Impact Areas and
 Flat-tailed Horned Lizard Distribution (1977-1997)
 Imperial Sand Dunes Recreation Area - Biological Assessment

0 2 4 6 Miles



5.0 Cumulative Effects

Cumulative effects under ESA regulations are defined as those of future nonfederal (state, local government, or private) activities that are reasonably certain to occur during the course of project activity. Future federal actions are subject to the consultation requirements established in Section 7 of the ESA and, therefore, are not considered cumulative to the actions under consideration. Most actions in the project area are federal or subject to federal review. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR 1508.7).

5.1 Peirson's Milk-vetch

A majority of Peirson's milk-vetch habitat (over 90 percent) is found in the Plan Area within the Imperial Sand Dunes, which are BLM-administered lands. A relatively small amount of the Peirson's milk-vetch habitat (about 5 percent) is found in lands with private or state in-holdings (BLM, 1987). At present, no specific nonfederal actions are proposed within these lands. Therefore, there are no anticipated cumulative impacts on the Peirson's milk-vetch as a result of nonfederal actions.

5.2 Desert Tortoise

There are no nonfederal actions proposed in the Plan Area that would add to cumulative impacts on the desert tortoise. However, as identified earlier, the Plan Area currently experiences a general decline in creosote bush scrub habitat due to increased human intrusion into the desert environment. The Draft RAMP may result in a likely increase in OHV activity in or adjacent to the open washes. These washes also may serve as corridors for not only the desert tortoise but also other wildlife. Potential direct impacts from OHV and camping activity to desert tortoises include direct mortality, loss of burrows, loss or changes to both composition and quality of the shrub cover, harassment (from humans and pets) and illegal collection. Potential indirect impacts from these activities include loss of forage vegetation, increased predation from ravens, noise, and dust. These OHV activities may have a cumulative impact upon this species. The various actions proposed under the implementation of the RAMP, such as the proposed 1-mile no camping buffer zone and restricted access through the microphyll woodland habitat, are anticipated to offset these potential impacts to desert tortoise and desert tortoise habitat, particularly east of the Plan Area in the creosote bush scrub/microphyll woodland/desert wash habitats. Cumulative impacts may result in a broader geographic zone of influence, subsequently resulting in potential impacts to the Chuckwalla Bench Critical Habitat Unit for the desert tortoise, located approximately 5 miles north-northeast of the Plan Area. Impacts to tortoises throughout their range are addressed in detail in the *Desert Tortoise (Mojave population) Recovery Plan* (USFWS 1994a).

5.3 Flat-tailed Horned Lizard

The most suitable habitat for the flat-tailed horned lizards outside the Imperial Sand Dunes is found in the southwest corner of the Plan Area, in the East Mesa ACEC. There are no specific nonfederal actions proposed in this area that would impact flat-tailed horned lizards. However, this area is currently subjected to existing OHV recreational activity, canal, pipeline, and road maintenance that may result in direct and indirect impacts to flat-tailed horned lizards. As identified for the desert tortoise cumulative impacts, the implementation of the proposed RAMP may compound the impacts to flat-tailed horned lizards within the ACEC through increased OHV and camping activity. However, the *Flat-tailed Horned Lizard Rangelwide Management Strategy* and designation of a 1-mile no-camping zone buffer are anticipated to minimize these potential impacts.

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Appendix A
Plant and Wildlife Species Potentially
Occurring Within the Plan Area

Plant and Wildlife Species Potentially Occurring Within the Plan Area

Common Name	Scientific Name	Status
Plants		
Algodones Dunes sunflower	<i>Helianthus niveus ssp. tephrodes</i>	BLM/FWS/SE/CNPS-1B
Arrow weed	<i>Pluchea sericea</i>	
Big galleta	<i>Hilaria rigida</i>	
Birdcage evening-primrose	<i>Oenothera deltoides</i>	
Borrego milk-vetch	<i>Astragalus lentiginosus var. borreganus</i>	CNPS-4
Brittlebush	<i>Encelia farinosa</i>	
Brown plume wirelettuce	<i>Stephanomeria pauciflora</i>	
Burrobush	<i>Ambrosia dumosa</i>	
Cheeseweed	<i>Hymenoclea salsola</i>	
California ditaxis	<i>Ditaxis californica</i>	BLM/FWS/CNPS-1B
California threeawn	<i>Aristida californica</i>	
Carrizo mallow	<i>Sphaeralcea orcuttii</i>	
Cattails	<i>Typha spp.</i>	
Common sandpaper plant	<i>Petlonyx thurberi</i>	
Common sunflower	<i>Helianthus annuus</i>	
Coulter's lyrepod	<i>Lyrocarpa coulteri var. palmeri</i>	BLM/CNPS-4
Creosote bush	<i>Larrea tridentata</i>	
Crown-of-thorns	<i>Koebeslina spinosa</i>	CNPS-2
Desert buckwheat	<i>Eriogonum deserticola</i>	
Desert dicoria	<i>Dicoria canescens</i>	
Desert lily	<i>Hesperocallis undulata</i>	
Desert panicum	<i>Panicum urvilleanum</i>	
Desert starvine	<i>Brandegea bigelovii</i>	
Desert thorn-apple	<i>Datura discolor</i>	
Desert unicorn plant	<i>Proboscidea altheaefolia</i>	CNPS-4
Desert willow	<i>Chilopsis linearis</i>	
Dyebush	<i>Dalea emoryi</i>	
Fairy duster	<i>Calliandra eriophylla</i>	CNPS-2
False daisy	<i>Eclipta alba</i>	
Fennel-leaf pondweed	<i>Potamogeton pectinatus</i>	
Foxtail cactus	<i>Escobaria vivipara var. alversonii</i>	BLM/FWS/CNPS-1B
Giant reed	<i>Arundo donax</i>	
Giant spanish needle	<i>Palafoxia arida var. gigantea</i>	BLM/FWS/CNPS-1B
Glandular ditaxis	<i>Ditaxis clariana</i>	CNPS-2
Hairy stickleaf	<i>Mentzelia hirsutissima</i>	FWS/CNPS-2
Hardwood's milk-vetch	<i>Astagus insularis</i>	CNPS-4
Honey mesquite	<i>Prosopis glandulosa</i>	
Horseweed	<i>Conyza canadensis</i>	
Ironwood	<i>Olneya tesota</i>	
Lineleaf white puff	<i>Oligomeris linifolia</i>	
Longleaf jointfir	<i>Ephedra trifurca</i>	
Mediterranean grass	<i>Schismus barbatus</i>	
Mormon tea	<i>Ephedra viridis</i>	
Munz's cholla	<i>Opuntia munzii</i>	BLM/FWS/CNPS-1B
Orocopia sage	<i>Salvia greatei</i>	BLM/FWS/CNPS-1B

Plant and Wildlife Species Potentially Occurring Within the Plan Area

Common Name	Scientific Name	Status
Palmer's crinklemat	<i>Tiquilia palmeri</i>	
Palo verde	<i>Cercidium floridum</i>	
Peirson's milk-vetch	<i>Astragalus magdalenae</i> var. <i>peirsonii</i>	BLM/FPE/SE/CNPS-1B
Plicate coldenia	<i>Tiquilia plicata</i>	
Ribbed cryptantha	<i>Cryptantha costata</i>	CNPS-4
Rock nettle	<i>Eucnida rupestris</i>	CNPS-2
Rush milkweed	<i>Asclepias subulata</i>	
Sand food	<i>Pholisma sonora</i>	BLM/CNPS-1B
Shortspike watermilfoil	<i>Myriophyllum exalbescens</i>	
Small-flowered tamarisk	<i>Tamarix parviflora</i>	
Smoke tree	<i>Psoralea argophylla</i>	
Spiny chloracantha	<i>Aster spinosus</i>	
Spotted cadythumb	<i>Polygonum fusiforme</i>	
Thurber's pilostyles	<i>Pilostyles thurberi</i>	CNPS-4
Verdin	<i>Auriparus subulata</i>	
White sweetclover	<i>Melilotus albus</i>	
Wiggin's cholla	<i>Opuntia wigginsii</i>	BLM/FWS/CNPS-3
Wiggin's croton	<i>Croton wigginsii</i>	BLM/FWS/SR/CNPS-3
Winged cryptantha	<i>Cryptantha holoptera</i>	CNPS-4
Woolly desert marigold	<i>Baileya pleniradiata</i>	
Wildlife		
American badger	<i>Taxidea taxa</i>	
American coots	<i>Fulica americana</i>	
American kestrel	<i>Falco sparverius</i>	
Andrew's dune scarab beetle	<i>Psuedocotalapa andrewsi</i>	BLM/FWS
Antelope ground squirrel	<i>Ammospermophilus leucurus</i>	
Arizona bell's vireo	<i>Pireo bellii arizonae</i>	BLM/SE
Arizona southwestern toad	<i>Bufo microscaphus microscaphus</i>	BLM/FWS
Barn owl	<i>Tyto alba</i>	
Big brown bat	<i>Eptesicus fuscus</i>	
Black tern	<i>Coalitionist niger</i>	BLM/FWS
Black-tailed gnatcatcher	<i>Poliophtila melanura</i>	
Black-tailed jackrabbit	<i>Lepus californicus</i>	
Black-tailed jackrabbit	<i>LepUs californicus</i>	
Black-throated sparrow	<i>Amphispiza bilineata</i>	
Brow-tassel weevil	<i>Trigonoscute brunnotasselata</i>	BLM/FWS
Burrowing owl	<i>Athene cunicularia</i>	BLM/FWS
Cactus wren	<i>Campylorhynchus burnnecapillus</i>	
California black rail	<i>Laterallus jamaicensis coturniculus</i>	BLM/FWS/ST
California leaf-nosed bat	<i>Macrotus californicus</i>	BLM/FWS
Carlson's dune beetle	<i>Anomala carlsoni</i>	
Cave myotis	<i>Myotis velifer</i>	BLM
Cheeseweed owlfly	<i>Oliarves clara</i>	BLM/FWS
Chuckwalla	<i>Sauromalus obesus</i>	BLM/FWS
Cliff swallow	<i>Hirundo pyrrhonota</i>	
Colorado desert fringe-toed lizard	<i>Uma notata notata</i>	BLM/FWS

Plant and Wildlife Species Potentially Occurring Within the Plan Area

Common Name	Scientific Name	Status
Colorado river cotton rat	<i>Sigmodon arizonae plenus</i>	BLM/FWS
Common yellowthroat	<i>Geothlypis trichas</i>	
Couch's spadefoot toad	<i>Scaphiopus couchi</i>	BLM/FWS
Coyote	<i>Canis latrans</i>	
Crissal thrasher	<i>Toxostoma dorsale</i>	
Desert cottontail	<i>Sylvilagus audubonii</i>	
Desert Iguana	<i>Dipsosaurus dorsalis</i>	
Desert kangaroo rat	<i>Dipodomys deserti</i>	
Desert pallid bat	<i>Antrozous pallidus pallidus</i>	
Desert tortoise	<i>Gopherus agassizii</i>	BLM/FT/ST
Desert woodrat	<i>Neotoma lepida</i>	
Ferruginous hawk	<i>Buteo regalis</i>	BLM/FWS
Flat tailed horned lizard	<i>Phrynosoma mcallii</i>	BLM
Gambel's quail	<i>Lophortyx gambelli</i>	
Gila woodpecker	<i>Melanerpes uropygialis</i>	BLM/FWS/SE
Gilded northern flicker	<i>Colaptes auratus chrysoides</i>	
Golden eagle	<i>Aquila chrysaetos</i>	
Great horned owl	<i>Bubo virginianus</i>	
Greater western mastiff bat	<i>Eumops porotis californicus</i>	BLM/FWS
Hardy's dune beetle	<i>Anomala hardyorum</i>	
House finch	<i>Carpodacus mexicanus</i>	
Kit fox	<i>Vulpes macrotis</i>	
Ladder backed woodpecker	<i>Picoides scalaris</i>	
Large-billed savannah sparrow	<i>Passerculus sanwicensis rostratus</i>	BLM/FWS
LeConte's thrasher	<i>Toxostoma lecontei</i>	
Lesser nighthawk	<i>Chordeiles acutipennis</i>	
Loggerhead shrike	<i>Lanius ludovicianus</i>	BLM/FWS
Long-eared owl	<i>Asio otus</i>	
Marsh wren	<i>Cistothorus palustris</i>	
Merlin	<i>Falco columbarius</i>	BLM/FWS
Merriam kangaroo rat	<i>Dipodomys merriami</i>	
Mountain plover	<i>Charadrius montanus</i>	BLM/FWS
Mourning dove	<i>Zenaida macroura</i>	
Mule deer	<i>Odocoileus hemionus</i>	
Northern harrier	<i>Circus cyaneus</i>	
Occult little brown bat	<i>Myotis lucifugus occultism</i>	BLM/FWS
Peregrine falcon	<i>Falco peregrinus</i>	BLM/FWS/FE/SE
Prairie falcon	<i>Falco mexicanus</i>	
Red-tailed hawk	<i>Buteo jamaicensis</i>	
red-wing blackbird	<i>Agelaius phoeniceus</i>	
Rosy boa	<i>Lichanura trivirgata</i>	BLM/FWS
Roundtail ground squirrel	<i>Spermophilus tereticaudus</i>	
Say's phoebe	<i>Sayornis saya</i>	
Sharp-shinned hawk	<i>Accipiter striatus</i>	
Side blotched lizard	<i>Uta stansburiana</i>	
Sidewinder rattlesnake	<i>Crotalus cerastes</i>	

Plant and Wildlife Species Potentially Occurring Within the Plan Area

Common Name	Scientific Name	Status
Small-footed myotis	<i>Myotis ciliolabrum</i>	BLM
Southwestern willow flycatcher	<i>Empidonax trailii extimus</i>	BLM/FPE/SE
Spadefoot toad	<i>Scaphiopus couchi</i>	BLM/FWS
Spotted bat	<i>Euderma maculatum</i>	BLM/FWS
Townsend's big-eared bat	<i>Plecotus townsendii</i>	BLM/FWS
Turkey vulture	<i>Cathartes aura</i>	
Vaux's swift	<i>Chaetura vauxi</i>	
Verdin	<i>Auriparus subulata</i>	
Warbling vireo	<i>Vireo gilvus</i>	
Western flycatcher	<i>Empidonax difficilis</i>	
Western least bittern	<i>Lxobrychus exilis hasperus</i>	BLM/FWS
Western pipistrelle bat	<i>Pipistrellus hesperus</i>	
Western screech-owl	<i>Otus kennicottii</i>	
Western whiptail lizard	<i>Cnemidophorus tigris</i>	
Western yellow billed cuckoo	<i>Coccyzus americanus occidentalis</i>	SE
White crowned sparrow	<i>Zonotrichia leucophrys</i>	
White rhatany	<i>Krameria grayi</i>	
White-faced ibis	<i>Plegadis chichi</i>	BLM/FWS
White-throated woodrat	<i>Neotoma albigula venusta</i>	BLM/FWS
Wild burro	<i>Equus asinus</i>	
Wilson's warbler	<i>Wilsonia pusilla</i>	
Yavapai leopard frog	<i>Rana yavapaiensis</i>	BLM/USFWS
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	
Yellow-rumped warbler	<i>Dendroica coronata</i>	
Yuma clapper rail	<i>Rallus longirostris yumanensis</i>	BLM/FE/SE
Yuma hispid cotton rat	<i>Sigmodon hispidus eremicus</i>	BLM/FWS
Yuma myotis	<i>Myotis yumanensis</i>	BLM
Yuma puma	<i>Felis concolor browni</i>	BLM/FWS
Zebra tailed lizard	<i>Callisaurus draconoides</i>	

Legend:

- BLM: Designated a sensitive species by the U.S. Bureau of Land Management
- FWS: Designated as a Special Status by the U.S. Fish and Wildlife Service
- FE: Federal listed as endangered
- FT: Federal listed as threatened
- FTE: Federal proposed for threatened status
- FPE: Federal proposed for endangered species
- SE: California state listed as endangered
- ST: California state listed as threatened
- SR: California state rare species
- CNPS: California Native Plant Society;
- 1B – Taxa determined to be rare, threatened, or endangered;
- 2 – Species rare or endangered in California but common elsewhere;
- 3 – More information on status needed;
- 4 – Species of limited distribution.